

## KEYENCE IL-300

# KEYENCE IL-300 Laser Sensor User Manual

Model: IL-300 | Brand: KEYENCE (Manufactured by Vanky Industry)

## 1. INTRODUCTION

The KEYENCE IL-300 is a high-precision laser displacement sensor designed for accurate measurement in various industrial applications. This manual provides essential information for the proper setup, operation, and maintenance of the IL-300 sensor to ensure optimal performance and longevity.



Figure 1.1: The KEYENCE IL-300 Laser Sensor, showing the main unit, connecting cable, and mounting bracket, alongside its product packaging.

## 2. SPECIFICATIONS

The following table details the technical specifications of the KEYENCE IL-300 Laser Sensor.

|   |                      |  |
|---|----------------------|--|
| Model   |                      | IL-300   |
| Reference distance  |                      | 300 mm 11.81"  |
| Measurement range   |                      | 160 to 450 mm 6.30" to 17.72"  |
| Light source  | Type                 | Red semiconductor laser, wavelength: 655 nm (visible light)  |
|   | Laser class          | Class 2 (FDA (CDRH) Part1040.10)*1<br>Class 2 (IEC 60825-1)  |
|   | Output               | 560 $\mu$ W <span>⊕ 添加到日历</span>   |
| Spot diameter (at standard distance)  |                      | Approx. $\phi$ 0.5 mm $\phi$ 0.02"   |
| Linearity   |                      | $\pm$ 0.25% of F.S. (160 to 440 mm 6.30" to 17.32")*2*3  |
| Repeatability   |                      | 30 $\mu$ m*4   |
| Sampling rate   |                      | 0.33/1/2/5 ms (4 levels available)   |
| Operation status indicators   |                      | Laser emission warning indicator: Green LED, Analog range indicator: Orange LED, Reference distance indicator: Red/Green LED |
| Temperature characteristics   |                      | 0.08% of F.S./°C*5   |
| Environmental resistance  | Enclosure rating     | IP67   |
|   | Pollution degree     | 3  |
|   | Ambient light        | Incandescent lamp: 5,000 lux*6   |
|   | Ambient temperature  | -10 to +50 °C 14 to 122 °F (No condensation or freezing)   |
|   | Relative humidity    | 35 to 85 % RH (No condensation)  |
|   | Vibration resistance | 10 to 55 Hz, Double amplitude 1.5 mm 0.06", 2 hours in each of the X, Y, and Z directions                                    |
| Material  |                      | Housing material: PBT, Metal parts: SUS304, Packing: NBR, Lens cover: Glass, Cable: PVC                                      |
| Weight  |                      | Approx. 135 g  |
| <p>*1 The laser classification for FDA (CDRH) is implemented based on IEC 60825-1 in accordance with the requirements of Laser Notice No.50.</p> <p>*2 Value when measuring the KEYENCE standard target (white diffuse object).</p> <p>*3 F.S. of each model is as follows. IL-030: <math>\pm</math>5 mm <math>\pm</math>0.20" IL-065: <math>\pm</math>10 mm <math>\pm</math>0.39" IL-100: <math>\pm</math>20 mm <math>\pm</math>0.79" IL-300: <math>\pm</math>140 mm <math>\pm</math>5.51" IL-600: <math>\pm</math>400 mm <math>\pm</math>15.75" IL-2000: +1000 to -1500 mm 39.37" to -59.05"</p> <p>*4 Value when measuring the KEYENCE standard target (white diffuse object) at the reference distance, sampling rate: 1 ms, and average number of times: 128. For the IL-300/IL-600, the sampling rate is 2 ms. For the IL-2000, the sampling rate is set to 5ms.</p> <p>*5 F.S. of each model is as follows. IL-030: <math>\pm</math>5 mm <math>\pm</math>0.20" IL-065: <math>\pm</math>10 mm <math>\pm</math>0.39" IL-100: <math>\pm</math>20 mm <math>\pm</math>0.79" IL-300: <math>\pm</math>140 mm <math>\pm</math>5.51" IL-600: <math>\pm</math>400 mm <math>\pm</math>15.75"</p> <p>*6 Value when the sampling rate is set to 2 ms or 5 ms.</p> |                      |  |

Figure 2.1: Overview of KEYENCE IL-300 technical specifications.

Table 2.1: KEYENCE IL-300 Detailed Specifications

| Parameter                            | Specification  |
|--------------------------------------|--|
| Model                                | IL-300   |
| Reference Distance                   | 300 mm (11.81")  |
| Measurement Range                    | 160 to 450 mm (6.30" to 17.72")  |
| Light Source Type                    | Red semiconductor laser, wavelength: 655 nm (visible light)  |
| Laser Class                          | Class 2 (FDA (CDRH) Part1040.10)*1, Class 2 (IEC 60825-1)  |
| Output                               | 560 μW   |
| Spot Diameter (at standard distance) | Approx. ø0.5 mm (ø0.02")   |
| Linearity                            | ±0.25% of F.S. (160 to 440 mm / 6.30" to 17.32")*2*3   |
| Repeatability                        | 30 μm*4  |
| Sampling Rate                        | 0.33/1/2/5 ms (4 levels available)   |
| Operation Status Indicators          | Laser emission warning indicator: Green LED, Analog range indicator: Orange LED, Reference distance indicator: Red/Green LED |
| Temperature Characteristics          | 0.08% of F.S./°C*5   |
| Environmental Resistance             |  |
| Enclosure Rating                     | IP67   |
| Pollution Degree                     | 3  |
| Ambient Light                        | Incandescent lamp: 5,000 lux*6   |
| Ambient Temperature                  | -10 to +50 °C (14 to 122 °F) (No condensation or freezing)   |
| Relative Humidity                    | 35 to 85 % RH (No condensation)  |
| Vibration Resistance                 | 10 to 55 Hz, Double amplitude 1.5 mm (0.06"), 2 hours in each of the X, Y, and Z directions                                  |
| Material                             | Housing material: PBT, Metal parts: SUS304, Packing: NBR, Lens cover: Glass, Cable: PVC                                      |
| Weight                               | Approx. 135 g  |

\*1 The laser classification for FDA (CDRH) is implemented based on IEC 60825-1 in accordance with the requirements of Laser Notice No.50.

\*2 Value when measuring the KEYENCE standard target (white diffuse object).

\*3 F.S. of each model is as follows. IL-030: ±5 mm ±0.20" IL-065: ±10 mm ±0.39" IL-100: ±20 mm ±0.79" IL-300: ±140 mm ±5.51" IL-600: ±400 mm ±15.75" IL-2000: +1000 to -1500 mm 39.37" to -59.05"

\*4 Value when measuring the KEYENCE standard target (white diffuse object) at the reference distance, sampling rate: 1 ms, and average number of times: 128. For the IL-300/IL-600, the sampling rate is 2 ms.

\*5 F.S. of each model is as follows. IL-030: ±5 mm ±0.20" IL-065: ±10 mm ±0.39" IL-100: ±20 mm ±0.79" IL-300: ±140 mm ±5.51" IL-600: ±400 mm ±15.75"

\*6 Value when the sampling rate is set to 2 ms or 5 ms.

### 3. SETUP AND INSTALLATION

Proper installation is crucial for the accurate and reliable operation of the IL-300 sensor. Follow these guidelines for setup.

#### 3.1 Unpacking and Inspection

- Carefully remove the sensor and all accessories from the packaging.

- Inspect all components for any signs of damage during transit. If any damage is found, contact your supplier immediately.
- Verify that all components listed in the packing list are present.



Figure 3.1: The IL-300 sensor unit, showing the attached cable and separate mounting hardware.

### 3.2 Mounting the Sensor

The IL-300 sensor should be mounted securely to a stable surface using the provided mounting bracket and screws. Ensure the sensor is positioned to allow for the target to be within the specified measurement range (160 to 450 mm) and ideally at the reference distance (300 mm) for optimal performance.

- Attach the mounting bracket to the sensor using the appropriate screws.
- Secure the sensor assembly to the desired location, ensuring it is stable and free from vibration.
- Consider the ambient light conditions; while the sensor has resistance up to 5,000 lux (incandescent lamp), direct strong light sources should be avoided if possible.





Figure 3.2: Rear view of the IL-300 sensor, illustrating the cable connection point.

### 3.3 Electrical Connections

Connect the sensor's cable to the appropriate power supply and control unit according to your system's wiring diagram. Ensure all connections are secure to prevent intermittent operation or damage.

- Verify the power supply voltage matches the sensor's requirements.
- Ensure proper grounding to prevent electrical noise interference.
- Avoid routing sensor cables near high-voltage lines or noise-generating equipment.

## 4. OPERATION

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Once installed and connected, the IL-300 sensor is ready for operation. The sensor provides an analog output corresponding to the measured distance.

### 4.1 Powering On

Apply power to the sensor. Observe the operation status indicators on the sensor unit.



Figure 4.1: Close-up view of the IL-300 sensor's indicator lights (CENTER, A. RANGE, LASER).

## 4.2 Understanding Indicators

- **Laser Emission Warning Indicator (Green LED):** Illuminates when the laser is emitting.
- **Analog Range Indicator (Orange LED):** Indicates if the measured distance is within the analog output range.
- **Reference Distance Indicator (Red/Green LED):** Changes color to indicate if the target is at or near the reference distance. Consult the full product manual for specific color meanings.

## 4.3 Measurement Principles

The IL-300 uses a red semiconductor laser to measure the distance to a target. The sensor outputs an analog signal proportional to this distance. Ensure the target surface is suitable for laser measurement (e.g., not highly reflective or transparent without proper setup).

- The optimal measurement is achieved when the target is at the reference distance of 300 mm.
- The sensor can measure within a range of 160 mm to 450 mm.
- The sampling rate can be adjusted (0.33/1/2/5 ms) depending on the application's speed requirements.

## 5. MAINTENANCE

The KEYENCE IL-300 sensor is designed for robust industrial use, but regular maintenance ensures its long-term reliability and accuracy.

- **Cleaning:** Periodically clean the lens cover (glass) with a soft, lint-free cloth. If necessary, use a mild, non-abrasive cleaning solution. Avoid harsh chemicals that could damage the lens or housing.
- **Cable Inspection:** Regularly inspect the sensor cable for any signs of wear, cuts, or damage. Damaged cables can lead to intermittent operation or complete failure.
- **Mounting Security:** Check that the sensor remains securely mounted and that all mounting screws are tight. Vibration can loosen connections over time.
- **Environmental Conditions:** Ensure the operating environment remains within the specified temperature (-10 to +50 °C) and humidity (35 to 85 % RH, non-condensing) ranges. While the sensor has an IP67 enclosure rating, protecting it from excessive dust and moisture will extend its lifespan.

## 6. TROUBLESHOOTING

If you encounter issues with your IL-300 sensor, refer to the following common troubleshooting steps before contacting support.

Table 6.1: Common Troubleshooting Guide




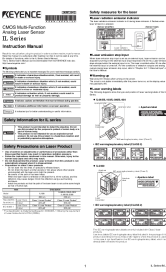

| Problem   | Possible Cause  | Solution  |
|---|---|---|
| Sensor not powering on / No indicators lit                | No power supply; Incorrect wiring; Damaged cable.   | Check power connections and voltage. Verify wiring according to the system diagram. Inspect cable for damage.   |
| Inaccurate or unstable measurements                       | Target outside measurement range; Dirty lens; Excessive vibration; Unsuitable target surface; Ambient light interference. | Ensure target is within 160-450 mm. Clean the lens cover. Secure mounting to reduce vibration. Consider target material/color. Reduce strong ambient light. |
| Laser emission warning indicator (Green LED) not lit      | Sensor malfunction; Power issue.  | Verify power supply. If power is present and other indicators function, the sensor may require service.   |
| Analog range indicator (Orange LED) not lit or flickering | Target outside analog output range; Sensor not properly calibrated for application.                                       | Adjust target position to be within the optimal analog range. Consult the full product manual for calibration procedures if applicable.                     |

If the problem persists after attempting these solutions, please contact your supplier or KEYENCE technical support for further assistance.

## 7. WARRANTY AND SUPPORT

For information regarding the warranty period and terms for your KEYENCE IL-300 Laser Sensor, please refer to the documentation provided at the time of purchase or contact your authorized KEYENCE distributor or the seller (Vanky Industry). Technical support is available from KEYENCE or your supplier for assistance with installation, operation, and troubleshooting. When contacting support, please have your product model (IL-300) and any relevant serial numbers or purchase details ready.

Related Documents - IL-300

|   |   |
|---|---|
|    | <p><a href="#">KEYENCE IL Series CMOS Multi-Function Analog Laser Sensor User's Manual</a></p> <p>User's manual for the KEYENCE IL Series CMOS Multi-Function Analog Laser Sensor. Provides detailed information on operations, installation, safety precautions, specifications, and troubleshooting for industrial laser sensor applications.</p>   |
|    | <p><a href="#">KEYENCE IL Series: CMOS Multi-Function Analogue Laser Sensors - High-Performance Displacement Measurement</a></p> <p>Explore the KEYENCE IL Series of CMOS multi-function analogue laser sensors, offering stable detection, high performance, and versatile applications for industrial automation. Features include tuning-less operation, wide detection ranges, and advanced algorithms.</p> |
|   | <p><a href="#">KEYENCE IL Series CMOS Multi-Function Analog Laser Sensor User's Manual</a></p> <p>This user's manual provides detailed information on the KEYENCE IL Series CMOS Multi-Function Analog Laser Sensor, covering installation, operation, safety precautions, specifications, and troubleshooting for industrial applications.</p>   |
|  | <p><a href="#">KEYENCE IL Series CMOS Multi-Function Analog Laser Sensor Instruction Manual</a></p> <p>Instruction manual for the KEYENCE IL Series CMOS Multi-Function Analog Laser Sensor. Covers safety precautions, installation, wiring, functions, and specifications for various models including IL-030, IL-065, IL-100, IL-300, IL-600, IL-2000, IL-1000, IL-1050, IL-1500, IL-1550.</p>               |
|  | <p><a href="#">Keyence IL Series CMOS Multi-Function Analog Laser Sensor   Ultra-Long Type</a></p> <p>Discover the Keyence IL Series, a versatile CMOS multi-function analog laser displacement sensor offering ultra-long measurement ranges up to 3.5m, high precision, and robust performance for diverse industrial applications. Learn about its features, models, specifications, and applications.</p>   |





### [Keyence IL Series CMOS Multi-Function Analog Laser Sensor | Ultra-Long Type](#)

Explore the Keyence IL Series CMOS Multi-Function Analog Laser Sensor, featuring an ultra-long measurement range up to 3.5m. This brochure details its intelligent, rugged, and easy-to-use design, advanced amplifier functions, diverse applications across industries, and comprehensive specifications for high-precision industrial measurement.