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CCD Laser Displacement Sensors

LK Series



Features

- Linearity of $\pm 0.1\%$ of F.S.
- Repeatability of $1\ \mu\text{m}$ **0.04 Mil**
- $30\ \mu\text{m}$ **1.18 Mil** diameter beam spot
- Ultra long measuring distance up to $750\ \text{mm}$ **29.53"**
- Measurement unaffected by color, surface texture or stray light

Expert Engineering Sites

A new site with answers to all of your difficult measurement application questions



www.keyence.com

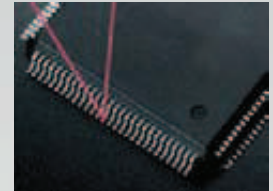


Measurement of various target surfaces

The LFTC circuit enables measurement of multicolored or patterned targets. Low reflectance targets, such as black rubber, can be measured without additional adjustment.

Laser beam spot of $30\ \mu\text{m}$ **1.18 Mil** diameter

KEYENCE's unique optical system minimizes lens aberration to give the LK-031 a minimum spot diameter of $30\ \mu\text{m}$ **1.18 Mil**. This enables the surface contour of a target to be accurately measured.



Lineup

Type	Compact/high-accuracy		High-precision	Standard
Model	LK-011		LK-031/036	LK-081/086
Measurement mode	Normal	Mirror surface	-	-
Reference distance				
Repeatability	0.1 μm 0.004 Mil		1 μm 0.039 Mil	3 μm 0.12 Mil
Linearity	$\pm 0.25\%$ of F.S.		$\pm 0.1\%$ of F.S.	
Sampling cycle	128/256/512/2,048 μs		512 μs	1,024 μs
Type	Long-distance			
Model	LK-503			
Measurement mode	High-precision mode		Long-range mode	
Reference distance				
Repeatability	10 μm 0.39 Mil		50 μm 1.95 Mil	
Linearity	$\pm 0.1\%$ of F.S.			
Sampling cycle	1,024 μs			

Specifications

Type		Compact high-accuracy	High-precision	Standard	Long-distance ¹	
Model	Sensor head	LK-011	LK-031/036	LK-081/086	LK-503	
	Controller	LK-3101	LK-2001/2011	LK-2101/2111	LK-2503	
Measurement mode		Normal (mirror surface)	—		High-precision mode	Long-range mode
Reference distance		10 mm (7.0 mm) 0.39" (0.28")	30 mm 1.18"	80 mm 3.15"	350 mm 13.78"	500 mm 19.69"
Measuring range		±1 mm (±0.9 mm) ±0.04" (±0.04")	±5 mm ±0.20"	±15 mm ±0.59"	±100 mm ±3.94"	±250 mm ±9.84"
Light source		Visible red semiconductor laser				
Output		0.95 mW				
Wavelength		670 nm			690 nm	
Laser Class		FDA (CDRH) Part 1040.10 IEC 60825-1			Class II Laser Product Class 2 Laser Product	
Spot diameter (at reference distance)		Approx. 20 μm 0.79 Mil	Approx. 30 μm 1.18 Mil (LK-031) Approx. 30 x 850 μm 1.18 x 33.46 Mil (LK-036)	Approx. 70 μm 2.76 Mil (LK-081) Approx. 70 x 1100 μm 2.76 x 43.3 Mil (LK-086)	Approx. 0.7 mm 0.03"	Approx. 0.3 mm 0.01"
Repeatability		0.1 μm ¹ 0.004 Mil	1 μm ¹ 0.039 Mil	3 μm ¹ 0.12 Mil	10 μm ¹ 0.39 Mil	50 μm ¹ 1.97 Mil
Linearity		±0.25% of F.S. ²	±0.1% of F.S. ²			
Sampling cycle		128/256/512/2,048 μs selectable	512 μs	1024 μs		
Analog output	Voltage output	±10 V (±9 V) (0.1 μm 0.004 Mil/mV) ³	±5 V (1 μm 0.039 Mil/mV) ³	±5 V (3 μm 0.12 Mil/mV) ³	±10 V (10 μm 0.39 Mil/mV) ³	±5 V (50 μm 1.97 Mil/mV) ³
	Impedance	100 Ω				
	Current output	4 to 20 mA (Applicable load: 350 Ω max.)				
Alarm output		NPN: 100 mA max. (40 V max.) (N.C.), Residual voltage: 1 V max.				
Other functions		AUTO ZERO, Response selection, Shift/Span adjustment, Holding output in alarm condition				
Power supply		24 VDC ±10%, Ripple: 10% (P to P) or less				
Current consumption		400 mA max.				
Temperature fluctuation	Sensor head	0.04% of F.S./°C	0.01% of F.S./°C		0.02% of F.S./°C	
	Controller	0.005% of F.S./°C	0.01% of F.S./°C			
Enclosure rating		IP64	IP67			
Ambient light		Incandescent or fluorescent lamp: 10000 lux max.				
Ambient temperature		0 to 50°C 32 to 122°F				
Relative humidity		35 to 85%, No condensation				
Housing	Sensor head	Aluminum die-cast				
	Controller	Polycarbonate				
Weight (including cable)	Sensor head	Approx. 80 g	Approx. 260 g	Approx. 385 g	Approx. 700 g	
	Controller	Approx. 515 g				

¹ Repeatability was obtained using KEYENCE's analog sensor controller (RD-50) with the number of averaging measurements set to 64.
Note: The ripple of the analog output may be 1 mV or more due to common mode noise when observed with an oscilloscope or a high-speed A/D conversion board.
² Linearity was obtained using KEYENCE's standard target (Zirconia block gauge: LK-031/036, LK-081/086, LK-011, White ceramic block gauge: LK-503).
³ When measurement is impossible, 12 V (31.2 mA) is output.
⁴ The LK-503 can both be used in High-precision mode or Long-range mode.

CAUTION

LASER RADIATION-DO NOT STARE INTO BEAM

SEMICONDUCTOR LASER 670nm
MAXIMUM OUTPUT 0.95mW
PULSED RADIATION
CLASS II LASER PRODUCT

AVOID EXPOSURE

LASER RADIATION IS EMITTED FROM THIS APERTURE.

CAUTION

LASER RADIATION WHEN OPEN DO NOT STARE INTO BEAM

LK-503 690nm
MAXIMUM OUTPUT 0.95mW
PULSED RADIATION
CLASS II LASER PRODUCT

CAUTION

LASER RADIATION WHEN OPEN DO NOT STARE INTO BEAM

SEMICONDUCTOR LASER 690nm
MAXIMUM OUTPUT 0.95mW
PULSED RADIATION
CLASS II LASER PRODUCT

AVOID EXPOSURE

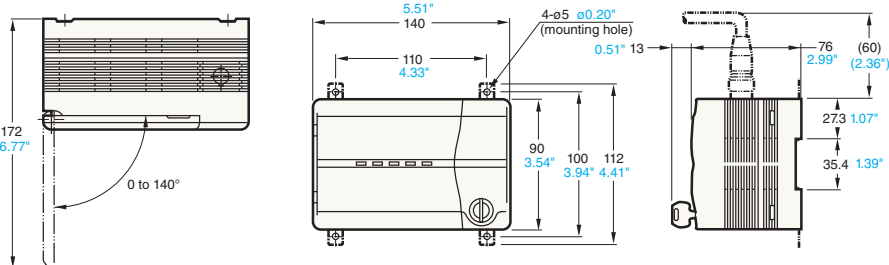
LASER RADIATION IS EMITTED FROM THIS APERTURE.

Dimensions

Controllers

LK-3101/2001/2011/2101/2111/2503

Unit: mm inch



Extension cable (Optional)

Cable length	Model
2 m 6.6'	LK-C2
5 m 16.4'	LK-C5
10 m 32.8'	LK-C10

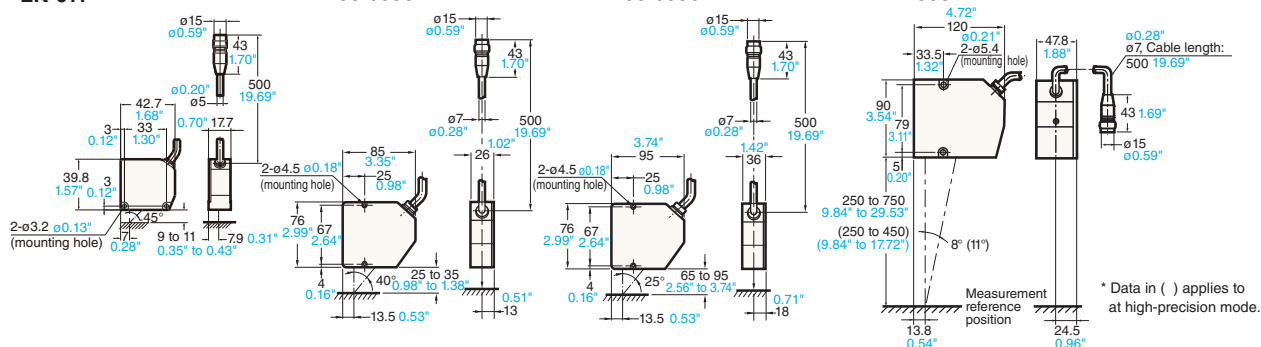
Sensor head

LK-011

LK-031/036

LK-081/086

LK-503



* Data in () applies to at high-precision mode.



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