



SKD-20S Laser Distance Sensor USER MANUAL



version 1.0

Getting more info & supports from <http://www.top1sensor.com>

Thank you for your choice for SKD laser distance sensor by SANKOE.LTD

Please read this user manual carefully before using our products

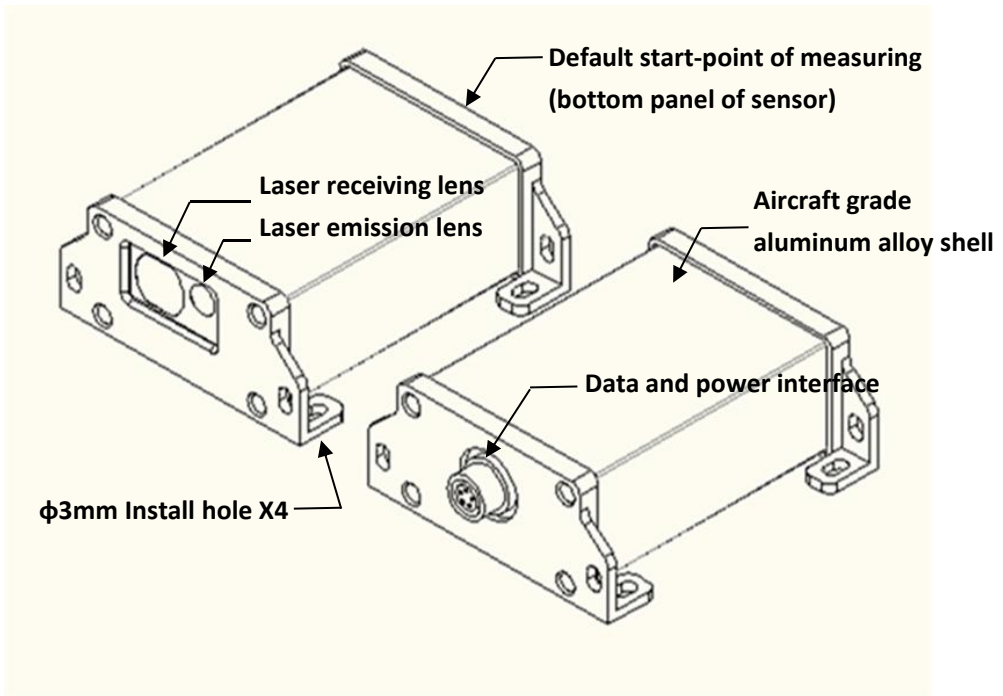
1. Overview

SANKOE.LTD is a professional manufacturer from China who provides high performance laser distance sensors and customized service. TOP1SENSOR.COM is our official e-commerce website.

SKD Laser distance sensor is a new kind of un-contact distance measuring equipment. It has many strengths such as high accuracy, long range and fast measuring speed when it's integrated in mine, wharf, bridge, tunnel, buildings, and other industrial measuring and controlled applications.

2. Features

SKD-20S(RS232) Laser distance sensor



- ① Long detection range (0.15 to 20m)
- ② High measuring accuracy (typical precision: $\pm 3\text{mm}$)
- ③ Fast to install

Using 4 screws can be quickly and firmly installed

- ④ Easy to operating

Automatic measurement by simple commands from computer

- ⑤ Safety in use

Laser class 2, harmless to the human body (avoid direct eye exposure)

- ⑥ Kinds of output type

RS232/485/TTL serial data output

4~20mA/0~5V/0~10V analog current/voltage output

Two-way switch output based on thresholds set by users

- ⑦ Long-life and high reliability with good protection

High waterproof and dustproof performance with aircraft grade aluminum alloy shell (the highest level is IP67)

- ⑧ Fully customized service based on 15+ years industry experience

3. Specifications

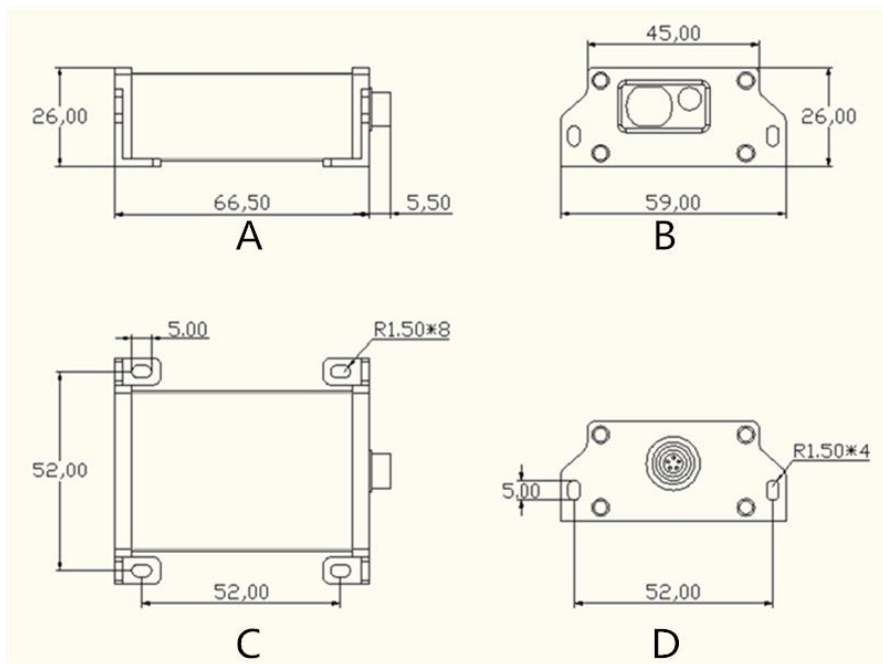
Laser Distance Sensor	SKD-20S(RS232)
Measuring Range	0.15m to 20m①
Measuring accuracy	typ: $\pm 3\text{mm}$
Smallest unit displayed	1mm
Laser class	2
Laser type	635nm, <1mW
Laser beam diameter approx.	
-at 10m distance	6mm
-at 50m distance	30mm
Measuring mode	
-trigger measuring	yes
-continuous measuring	yes
Operation mode	commands by computer
Output mode	RS232 serial digital output

Power supply	DC 9~24V/1A
Power consumption	<3W
Temperature range	
-storage	-25℃ to 70℃
-operating	-10℃ to 50℃ ^②
Dimension	67 x 59 x 26 mm ^③
Weight	90g

① Use a target plate to increase the measurement range during daylight or if the target has poor reflection properties.

② The highest operating temperature is 40℃ when sensor works in continuous measuring mode. The lowest operating temperature is -25℃ with special customized edition sensor.

③ The details of dimension are shown in the following image.



A : Right side view

B : Front view

C : Top view

D : Back view

4.Using instructions

1.Cable connecting definitions

Red line	---	VCC
Black line	---	PGND
Yellow line	---	RX(PC)
Green line	---	TX(PC)
Blue line	---	DGND

2.Operating Steps

2.1 Connect sensor to a serial port of computer (or other device which has serial ports), then connect to a power port of adapter with special data cable.

2.2 Single Measuring

2.2.1 Send a command "O" (ASCII) by computer to turn on the sensor. Then sensor will emit a laser beam and prepare for working, and return the data " --- " (ASCII) to the serial interface.

2.2.2 Send a command "O" (ASCII) again to the sensor to start to measure distance. The sensor will return the measured data like "XXXXX" (ASCII) to the serial interface and turn off laser beam when it finished a single measurement.

2.2.3 Send a command "U" (ASCII) to turn off the sensor.

2.3 Continuous Measuring

2.3.1 Send a command "O" (ASCII) by computer to turn on the sensor. Then the sensor will turn on the laser and prepare for working, return the data " --- " (ASCII) to the serial interface.

2.3.2 Send a command "C" (ASCII) to the sensor. The sensor will begin to measure continuously after 2 seconds when it got the order, and return the data continuously like "XXXXX" (ASCII).

If the sensor couldn't get any available data, it will return " --- " to the serial interface.

2.3.3 Send a command "U" (ASCII) to turn off the whole sensor (include both of laser unit and measuring unit).

5.Input and output

1.Data format

Baud rate: 9600 bps , Parity bit: None , Data bits: 8 , Stop bit: 1

2.Input frame format

There is only one byte in every input frame. Users could send different commands to the sensor for different purpose, the functions of command are shown in the following table.

HEX	0X4F	0X43	0X55
ASCII(Capital letter)	O	C	U
Functions of command	Power On & Trigger Measuring	Continuous Measuring	Power Off

3.Output frame format

Digital output data is displayed as ASCII code, there is 6 bytes in every data frame. The frame header is 0XFF, the next bytes are measured distance numbers. A: tens of thousands B: thousands, C: hundreds, D: tens, E: ones. (unit: mm)

Notice: If any byte in a data frame is not used, the sensor will return "spacing"(HEX:0X20) in that byte.

Header	A	B	C	D	E
0XFF	tens of thousands	thousands	hundreds	tens	ones

For example, if the measured distance data is 12345mm, then the sensor will return data as"12345"(HEX: FF 31 32 33 34 35).

Or the measured distance data is 287mm, then the sensor will return data as" 287"(HEX: FF 20 20 32 38 37).

If the sensor couldn't get any available data(out of measurement range or measured in blind zone), it will return " - - -"(HEX:FF 20 2D 2D 2D 20) to the

computer.

6.Troubleshooting

1.Actual measuring range is different with typical value

Laser distance sensor is a new of un-contact optical measuring equipment. Its measuring range and accuracy will be effect by many external environmental factors. So actual measuring result might be different with typical value which is measured in standard environment.

The following factors will effect actual measuring range:

Effect Factors	Increase measuring range	Decrease measuring range
Surface of target	Bright and smooth surface with good reflection, like target plate	Deep color and rough surface, like green or blue target surface
Air visibility	Clean air	Dust, fog, storm and rain, snow
Ambient light	Dark environment	Target exposure to strong light, like sunlight in midday
Laser emission	Laser emission lens and protection glass keep clean and smooth	Laser emission lens and protection glass get dirty or scratched

In conclusion, the best measuring result will be happen in a dark environment and with a good reflection target. We strongly suggest to use a target plate when laser distance sensor works in a poor environment.

We also suggest to keep laser emission lens and protection glass clean with a soft cloth before start to using.

2.Error code display

All of error codes are displayed as “E 2XX”(HEX: FF 45 20 XX XX XX).

The following errors can be corrected.

Display Notice	Cause	Correction
E 204(FF 45 20 32 30 34)	Calculation error	Repeat procedure
E 252(FF 45 20 32 35 32)	Temperature too high	Let device cool down
E 253(FF 45 20 32 35 33)	Temperature too low	Warm device up
E 255(FF 45 20 32 35 35)	Received signal too weak, time for a measurement too long.	Use a target plate
E 256(FF 45 20 32 35 36)	Received signal too strong	Use target plate(gray side)
E 257(FF 45 20 32 35 37)	Faulty measurement, too much background light	Use target plate(brown side)
E 258(FF 45 20 32 35 38)	Outside of the range of measurement	Select measurement distance within the range of measurement
E 260(FF 45 20 32 36 30)	Laser beam interrupted	Repeat the measurement

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Getting more info & supports from <http://www.top1sensor.com>