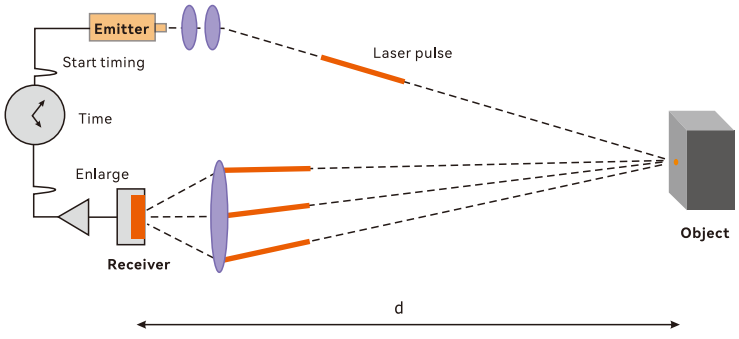
Laser Lidar
AS Series

Industrial obstacle avoidance lidar

AKUSENSE's new generation TOF single-line LiDAR boasts high reliability, stable performance, and cost-effectiveness. It's an ideal choice for industrial AGVs, mobile robots, and low-speed robots.

Single-line laser lidar

Accurate 2D scanning of object contours on flat surfaces



Mainstream performance of TOF single-line lidar

Measurement distance ≥ 10 m (70% reflectivity), ≥ 4 m (10% reflectivity)

Horizontal viewing angle: 270° scanning angle, can be divided into 64 independent channels

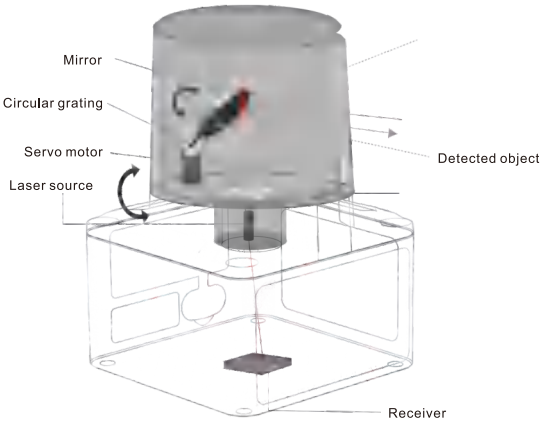
Measurement rates up to 54 KHz

Product Highlights

AS Series

Unique structural design, high reliability

The use of lightweight rotary mirror design, with precision brushless silent motor, making the product stable and reliable operation.



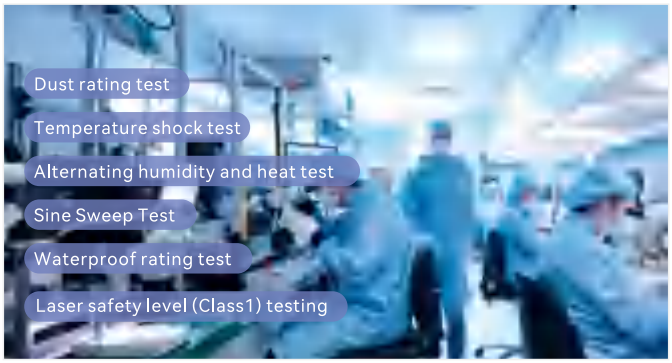
Supports serial port (Type-C connector) communication *

Online real-time output of measurement data (including distance and light intensity data in each direction)

* AS-33C

Vibration and shock resistant, adapting to a variety of inspection scenarios

Precision dust-free assembly process, through the high-intensity vibration test and harsh impact test, product consistency is good.



Lidar Technology

Pulsed TOF high-speed ranging technology:

AKUSENSE's full range of LIDAR products utilize direct time-of-flight (dTOF) technology for distance measurement.

This means that short, nanosecond pulses with high instantaneous power are emitted and the distance to the target is calculated by measuring the round trip time of the pulse.

Compared to other commonly used ranging mechanisms (e.g. triangulation based on geometric similarity, and phase ranging using the phase difference between the transceiver channels), it is much faster and has a longer detection distance.

Weak echo signal processing with high signal-to-noise ratio

Pulse echo signal at the receiving end of the photoelectric sensor to form a weak photocurrent, converted to voltage signals and through several levels of amplification and conditioning, by the timing circuit for subsequent processing.

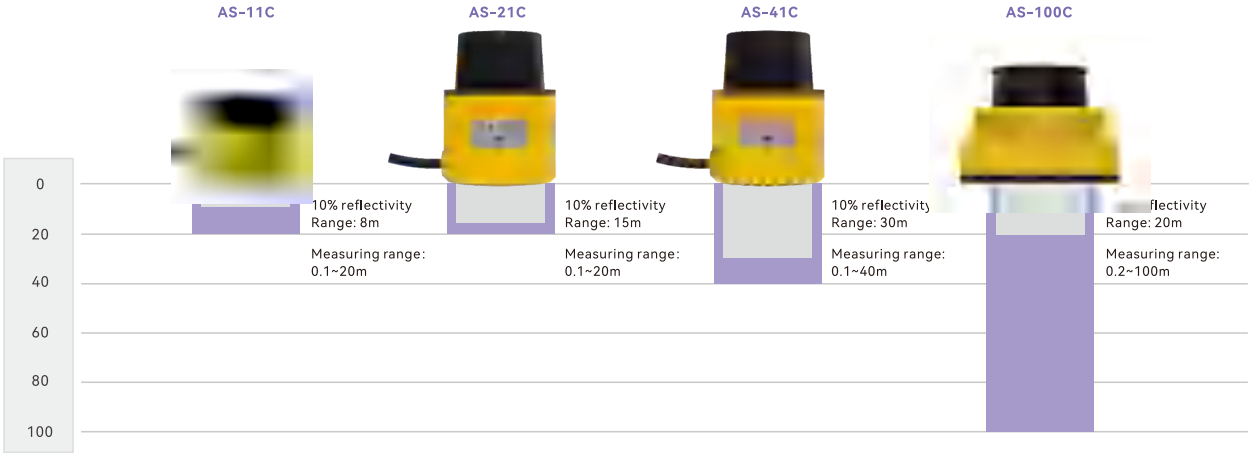
In order to ensure the stability and reliability of the measurement results, the entire signal processing path is sufficient to meet the requirements of TOF ranging on the large bandwidth and high signal-to-noise ratio, so as to capture the weaker signals and measure longer distances.

Application

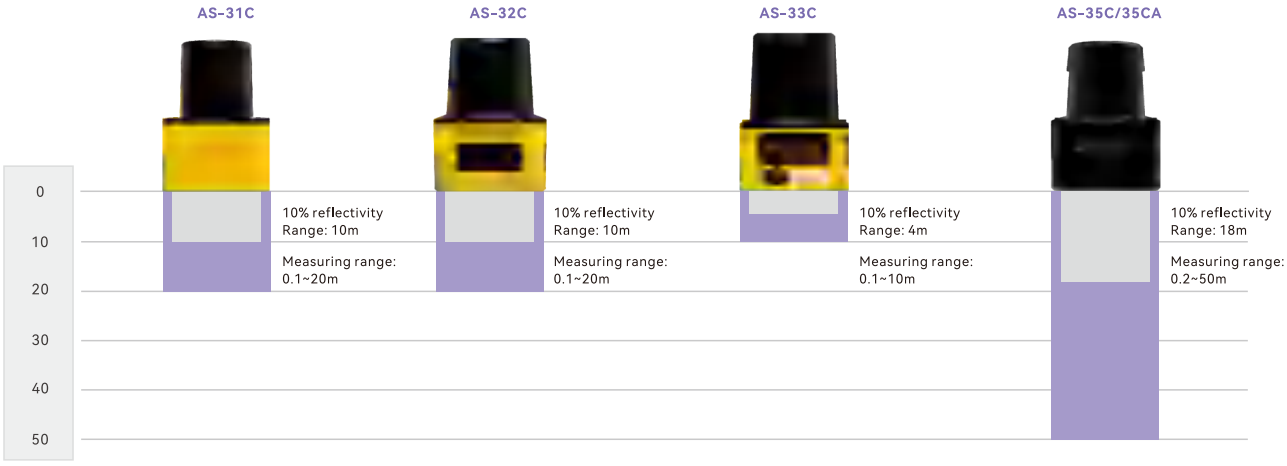
AGV Navigation

Construction Machinery Collision Avoidance

Selection table



Model.	AS-11C	AS-21C	AS-41C	AS-100C
Scanning angle	360°	300°	300°	360°
Resolution	0.5°	0.5°(default)/0.25°/0.125°	0.5°(default)/0.25°/0.125°	0.05°/0.1°
Scanning frequency	12.5Hz	25Hz(default)/12.5Hz/6.25Hz	25Hz(default)/12.5Hz/6.25Hz	10Hz/20Hz



Model.	AS-31C	AS-32C	AS-33C	AS-35C/35CA
Scanning angle	270°	270°	270°	360°
Resolution	0.12°/0.18°/0.23°/0.35°	0.12°/0.18°/0.23°/0.35°	0.5°	0.06°/ 0.09°/ 0.12°/ 0.18°
Scanning frequency	10Hz/15Hz/20Hz/25Hz/30Hz	10Hz/15Hz/20Hz/25Hz/30Hz	25Hz	10 Hz /15 Hz /20 Hz /30 Hz

LiDAR Scanner

AS-21/41C

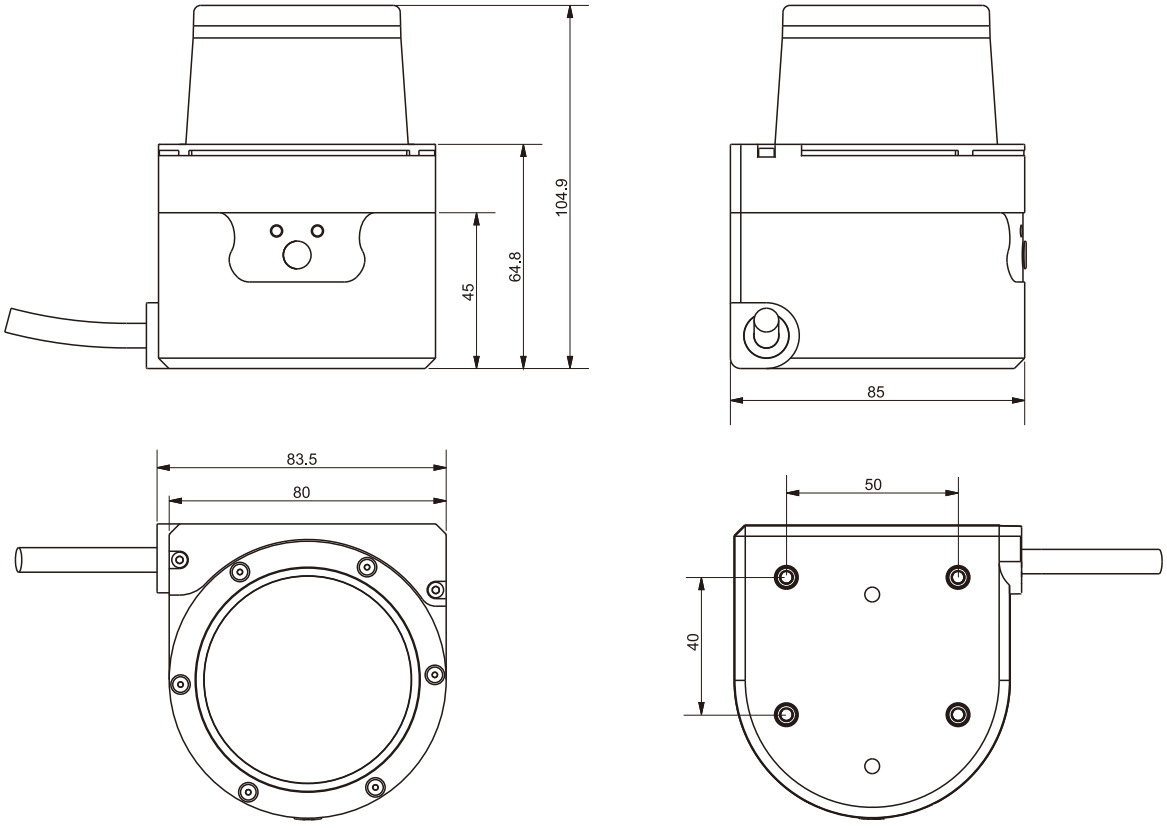
TOF principle

CE

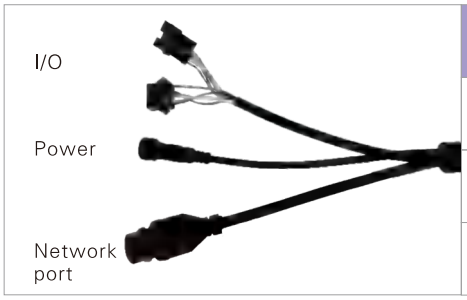
Basic Features	Working principle		TOF	
	Optical working principle		Diffuse Reflection	
	Light source		Infrared laser (905nm)	
	Laser spot exit aperture		8mm	
	Scanning range		300°	
	Scanning angle resolution		0.5°(default)/0.25°/0.125°	
	Measuring range		0.1m ~20m	0.1m ~40m
	Measurement Error	System error (typical)	±5cm	±5cm(1m~20m); ± 10cm(20m~40m)
		Statistical error(1σ)	±2cm	±2cm(1m~20m); ± 4cm(20m~40m)
	Indicator		Quantity: 2; Definition: ERR (Equipment Alarm: Failure/Abnormality, Dirty/Shade of Transparent Cover, High/Low Temperature, Dense Fog); HTR (Operation Status Indication: Detecting Signal/Self-Learning)	
Electrical data	Operating voltage		10V~28V DC	
	Power consumption		5W(Measuring)，3.6W@DC 12V/14.4W@DC 24V(Heating)	
	Communication		Ethernet, rate: 10/100 Mbps; Network protocol: TCP/P: Functions: device configuration/ measurement data output/monitoring signal output	
Environmental conditions	Operating temperature		-25℃~+50℃	
	Storage temperature		-30℃~+70℃	
	Operating humidity		93%,+40℃,2h(GB/T2423.3)	
	Ambient Illumination		≤70,000Lux	
	Vibration resistance		GB/T 2423,10	
	Enclosure rating		IP65(GB4208~2008)	
Mechanical data	Connection		GB/T 2423,10	
	Dimension		83.5×85×104.9(mm)	
	Material		Aluminum Alloy	
	Weight		0.6kg	
	Accessories		Side/sit composite bracket AS-21C-AT, power cable AS-21C-EC, standard RJ45 cable, waterproof sheath for cable crystal head, hexagonal M4*8 screws, spacers, recommended installation tools.	
Special function	Safety class		Class I(GB 7247.1-2012, human eye safety)	
	Laser spot emission angle		12.5mrad	
	Scanning frequency		300°(-60°~+240°)	
	Model		**AS-21C**	**AS-41C**

Unit:mm

Dimensions

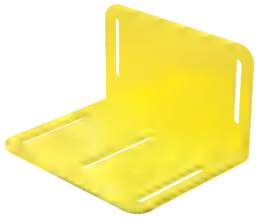


Power Interface



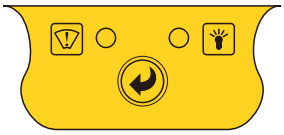
Socket	Type	Explanation
DC002	Power	Female 2 pin
Ethernet	RJ45 socket	4 pin
I/O	Cable	10 pin

Accessories

			Mounting screws, gasket and easy installation tool
Composite Bracket: AS-21C-AT 1 Piece	Power Cable: AS-21C-EC 1 Strip	Crystal Protective Cover: AS-21C-WJ 1 Piece	Accessories: M4x8 1 Set

LiDAR Scanner

Indicators and Operation Buttons



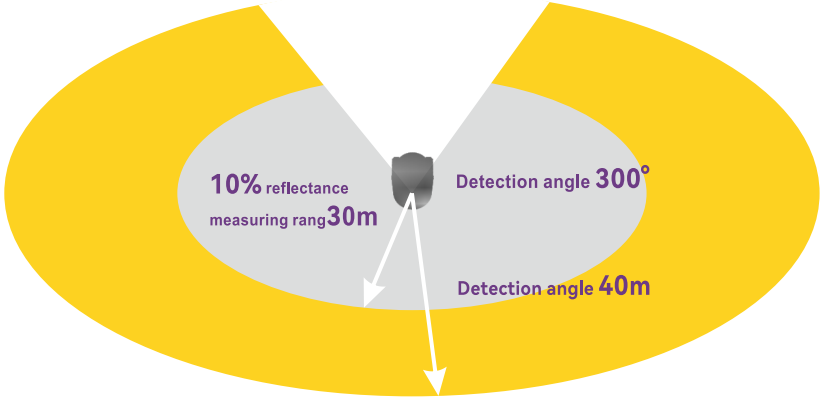
Name	Instructions
ERR	Work fault indicator ◆ Startup state: Light on(About 27s)Always off: No fault ◆ Always on:Internal fault ◆ Always on: Internal fault,Abnormal measurement ◆ Long flicker (0.25Hz) : High / low temperature alarm ◆ Short flicker(1Hz) : Transmissive cover is dirty/occluded[1]
HTR	Work status indicator ◆ Startup state: Off ◆ Off: The device does not start measuring/ready to restart ◆ Always on:Equipment normal measurement ◆ Flash1 (0.5Hz) : Monitor Signal output ◆ Flash2 (1Hz) : Self−learning[2] ◆ Flash3 (2.5Hz) : Ready to start self−learning[2]
SLR	Operation button ◆short press (1s~5s)Start background self−learning ◆Long press(≥ 6s) : Delete background

1:Including being blocked by dense fog or the detection area being blocked.
2:Including "background self−learning" and "normal goal self−learning"(customization function).

Measuring coordinate system/scan range/range

AS-21C

AS-41C



MINI LiDAR Scanner

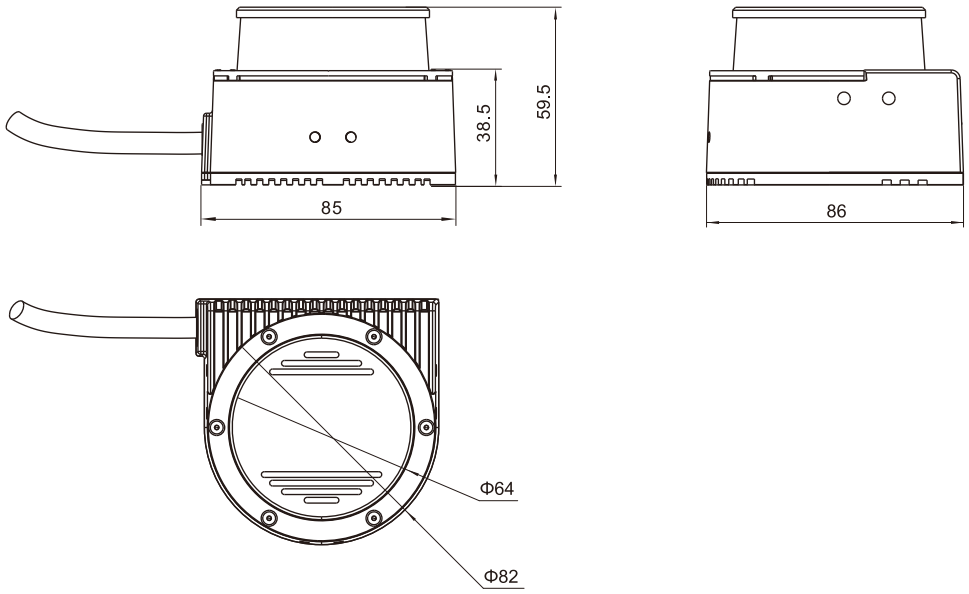
TOF principle

Basic Features	Working principle		TOF
	Optical working principle		Diffuse Reflection
	Light source		Infrared laser (905nm)
	Laser spot exit aperture		10mm
	Scanning range		360°
	Scanning angle resolution		0.5°
	Measuring range		0.1m ~20m
	Measurement Error	System error (typical)	±5cm(1m~15m)
		Statistical Error(1σ)	±2cm(1m~15m)
	Indicator		Quantity: 2; Definition: ERR (Equipment Alarm: Failure/Abnormality, Dirty/Shade of Transparent Cover, High/Low Temperature, Dense Fog); HTR (Operation Status Indication: Detecting Signal/Self-Learning)
Electrical data	Operating voltage		12V~28V DC
	Power consumption		4.5W@DC 24V
	Communication		Ethernet, rate: 10/100 Mbps; Network protocol: TCP/P: Functions: device configuration/ measurement data output/monitoring signal output
Environmental conditions	Operating temperature		-10℃~+45℃
	Storage temperature		-30℃~+70℃
	Operating humidity		93%,+40℃,2h(GB/T2423,3)
	Ambient Illumination		≤70,000Lux
	Vibration resistance		GB/T 2423,10
	Enclosure rating		IP65(GB4208~2008)
Mechanical data	Connection		Cable Connection
	Dimension		86.0×85.0×59.5(mm)
	Material		Aluminum Alloy
	Weight		0.5kg
	Accessories		Power Supply，RJ45 socket，Leads
Special function	Safety class		Class I(GB 7247.1-2012, human eye safety)
	Laser spot emission angle		10.0(H) × 2.0(V)mrad
	Scanning frequency		360°
	Model		**AS-11C**

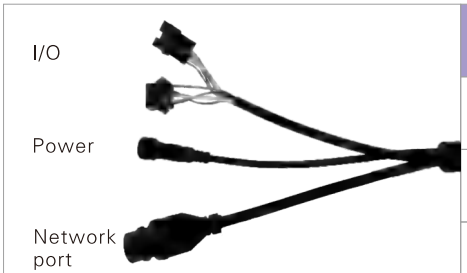
LiDAR Scanner

Dimensions

Unit:mm

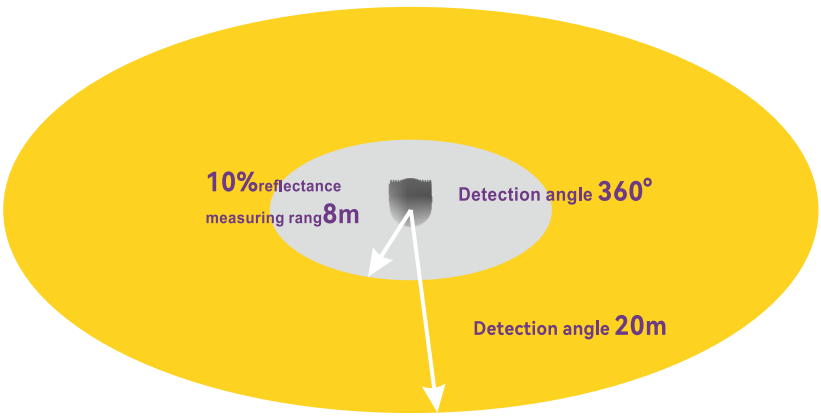


Power Interface

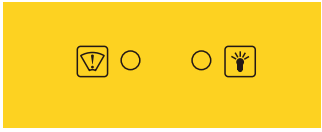


Socket	Type	Explanation
DC002	Power	Female 2 pin
Ethernet	RJ45 socket	4 pin
I/O	Cable	9 pin

Accessories



Indicators and Operation Buttons



Name	Instructions
ERR	Work fault indicator ◆Startup status: bright (About 27s) ◆Off: No fault ◆Steady light: Internal fault ◆Long flicker (0.5 Hz): High temperature / low temperature alarm ◆Short flicker (1Hz): Transmissive cover is dirty/occluded[1]
HTR	Work status indicator ◆Startup state: off ◆Off: The device does not start measurement/ready to reboot ◆Bright: Normal measurement of equipment ◆Flashing 1 (0.5Hz): Monitor signal output ◆Flashing 2 (1Hz): Self–learning[2] ◆Flashing 3 (2.5Hz) : Ready for self–learning[2]

1:Including being blocked by dense fog or the detection area being blocked.
2:Including "background self–learning" and "normal goal self–learning"(customized function).

Accessories

			Mounting screws, gasket and easy installation tool
Side bracket: A AS–11C–AT	Cable:A piece of AS–11C–EC	Network cable crystal head waterproof jacket: A AS–11C–WJ	Accessories:A set of M4x8

LiDAR Scanner

Navigation Type

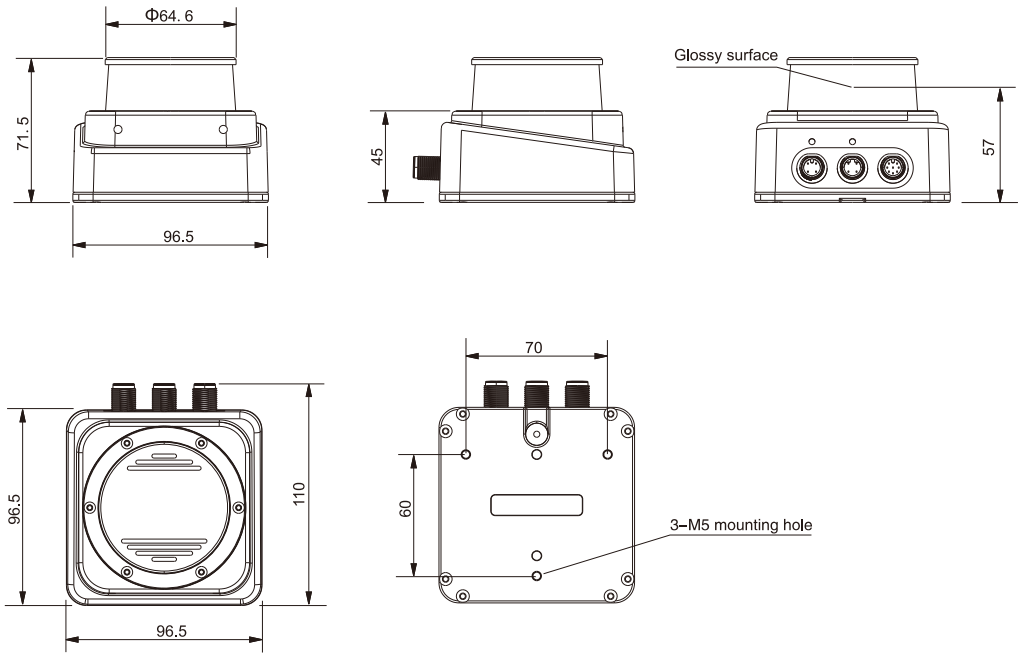
TOF principle

NEW!

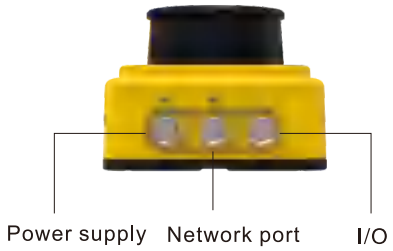
Basic Features	Working principle		TOF
	Optical working principle		Diffuse Reflection
	Light source		Infrared laser (905nm)
	Laser spot exit aperture		10mm
	Scanning angle		360°
	Scanning angle resolution		0.05°/0.1°
	Measuring range		0.2m ~100m
	Measurement Error	System error (typical)	Distance measurement：25mm(1m~20m) / 40mm(20m~50m)；RSSI Measurement：2%(1m~20m) / 4%(20m~50m)
		Statistical Error(1σ)	Distance measurement：10mm(1m~20m) / 20mm(20m~50m)；RSSI Measurement：1%(1m~20m) / 2%(20m~50m)
	Indicator		Quantity: 4; Definition: PWR: Power indicator; LNK: Ethernet indicator; ERR: Operating fault indicator; HTR: Normal measurement indicator
Electrical data	Operating voltage		9V~30V DC
	Power consumption		5W@DC 24V
	Communication		Ethernet: Rate: 10/100Mbps; Functions: device configuration/measurement data output
Environmental conditions	Operating temperature		-10℃~+50℃
	Storage temperature		-30℃~+70℃
	Operating humidity		93%,+40℃,2h(GB/T2423.3)
	Ambient Illumination		≤80,000Lux
	Vibration resistance		GB/T 2423.10
	Enclosure rating		IP65(GB4208~2008)
Mechanical data	Connection		Connector
	Dimension		110x96.5x71.5mm
	Material		Aluminum Alloy
	Weight		0.7kg
	Accessories		Power cables, RJ45 network cables, I/O cables, mounting screws, spacers and easy installation tools, vibration isolating screws, nuts and spacers
Special function	Safety class		Class I(GB 7247.1-2012, human eye safety)
	Laser spot emission angle		2.0(H)×8.0(V)mrad
	Scanning frequency		10Hz/20Hz
	Working condition		Resistant to sunlight, dirt, supports smoke penetration, non-rainfall conditions
	Measurement data		Composite data (distance + RSSI)
	Device self-test		Contents: Dirty/obstructed light transmission cover/high/low temperature
	Model		**AS-100C**

Unit:mm

Dimensions

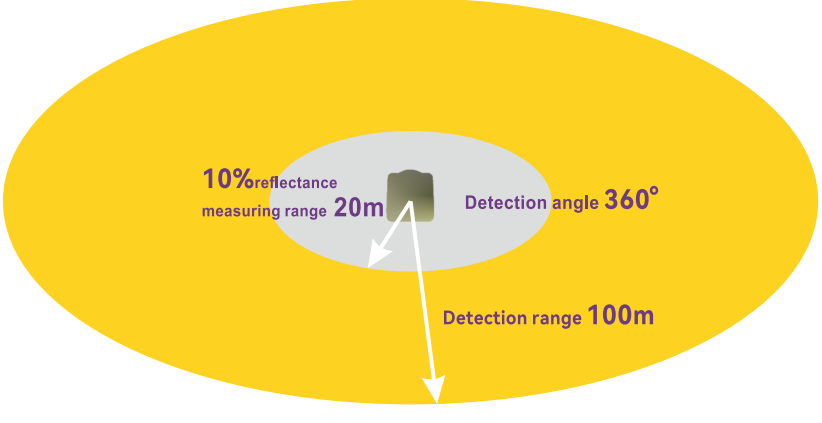


Power connector



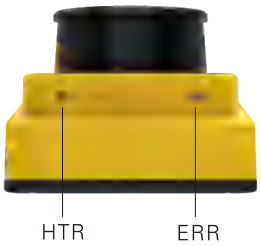
Socket	Types	Number of terminal
Power supply	M12(Type A), Male	4
Etherne	M12(Type B), Male	4
I/O	M12(Type B), Male	8

Measuring coordinate system/scanning range/range



LiDAR Scanner

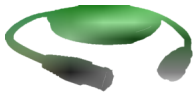
Indicators and Operation Buttons



Name	Description
PWR	Power Indicator ◆Normal off: no power / power is invalid ◆Constant light: power on
LNK	Ethernet indicator ◆Always off: no network connection ◆Always on: there is a network connection
ERR	Work failure indicator ◆Starting state: Yellow (about 24 seconds) ◆Green: no fault ◆Yellow: internal fault/measurement abnormal[1] ◆Long flashing (0.5Hz): high temperature/low temperature alarm ◆Short flashing (1Hz): Dirty/obstructed light transmission cover[2]
HTR	Normal measurement indicator ◆Starting state: off ◆Always off: the device has not started to measure ◆Always on: the equipment is measuring normally

1: Including measurement stop and motor stop;
2: Including being blocked by dense fog.

Accessories

					Mounting screws, washers And easy installation tools
Mounting bracket: AS-100C-AT set	M12 dust plug Comes with	Power cable: AS-100C-EC A	RJ45 network cable: AS-100C-IOCB A	I/O cable: AS-100C-IOCB A	Parts and accessories: M5x8 set

AS-31/32C

TOF principle

Basic Features	Working principle		TOF	
	Optical working principle		Diffuse Reflection	
	Light source		Infrared laser (905nm)	
	Laser spot exit aperture		7*3mm	4.5*2mm
	Scanning angle		270°	
	Scanning angle resolution		0.12°/0.18°/0.23°/0.35°	
	Measuring range		0.1m ~20m（70% reflectivity）；0.1m - 10m（10% reflectivity）	
	Measurement Error	Resolution	1cm	
		Linearity	2cm	
	Indicator		–	
Electrical data	Operating voltage		DC 12V	DC 9~28V
	Power consumption		5W	
	Communication		Ethernet or RS485	
Environmental conditions	Operating temperature		–20℃~60℃	
	Storage temperature		–20℃~70℃	
	Operating humidity		93%,+40℃,2h(GB/T2423.3)	
	Ambient Illumination		≤80,000Lux	
	Vibration resistance		500m/s (about 50G), 3 times each in XYZ direction	
	Enclosure rating		IP65(GB4208~2008)	
Mechanical data	Connection		Cable Connection	
	Dimension		60×60×84.9(mm)	60×60×81.3(mm)
	Material		Aluminum Alloy	
	Weight		0.25kg	
	Accessories		DC5521 female power socket, RJ45 Ethernet male	
Special function	Safety class		Class I(GB 7247.1-2012, human eye safety)	
	Laser spot emission angle		5.2*9mrad	4.0*2mrad
	Scanning frequency		10Hz/15Hz/20Hz/25Hz/30Hz	
	Working condition		Indoor	
	Application		Navigation	
	Device self-test		Yes	
	Abnormal alarm function		Yes	
	Sampling frequency		30KHz	
	Model		**AS-31C**	**AS-32C**

LiDAR Scanner

AS-33C

TOF principle

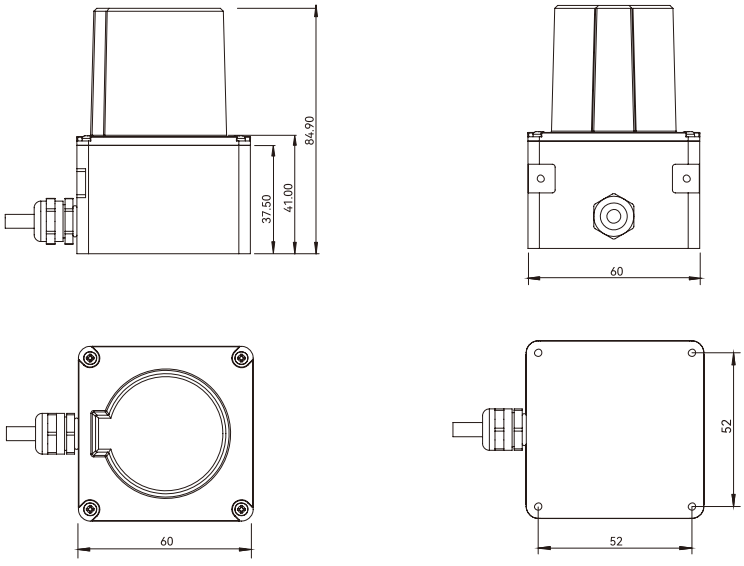
CE

Basic Features	Working principle	TOF
	Optical working principle	Diffuse Reflection
	Light source	Infrared laser (905nm)
	Laser spot exit aperture	4.5(V)*2(H)mm
	Scanning angle	270°
	Scanning angle resolution	0.5°
	Measuring range	10 m（70%reflectivity）/4 m（10%reflectivity）
	Measurement error	±2 cm(≤10m)
	Indicator	4 (3 zone signals, 1 fault signal)
Electrical data	Operating voltage	DC 9 V ~28 V
	Power consumption	Rated power: < 1 W (no load); starting power: < 3 W (no load)
	Communication	USB-TYPE C(Serial port)
Environmental conditions	Operating temperature	–10℃~50℃
	Storage temperature	-20℃~70℃
	Operating humidity	85% or less, non-condensing
	Ambient Illumination	≤80000 Lux
	Vibration resistance	500m/s (about 50G), 3 times each in XYZ direction
	Enclosure rating	IP65
Mechanical data	Connection	Cable Connection
	Dimension	50x50x72mm
	Material	Aluminum
	Weight	171g
	Accessories	Threaded
Special function	Sampling frequency	18KHz/54KHz
	Response time	40 ms
	Start-up time	<10s
	Model	**AS-33C**

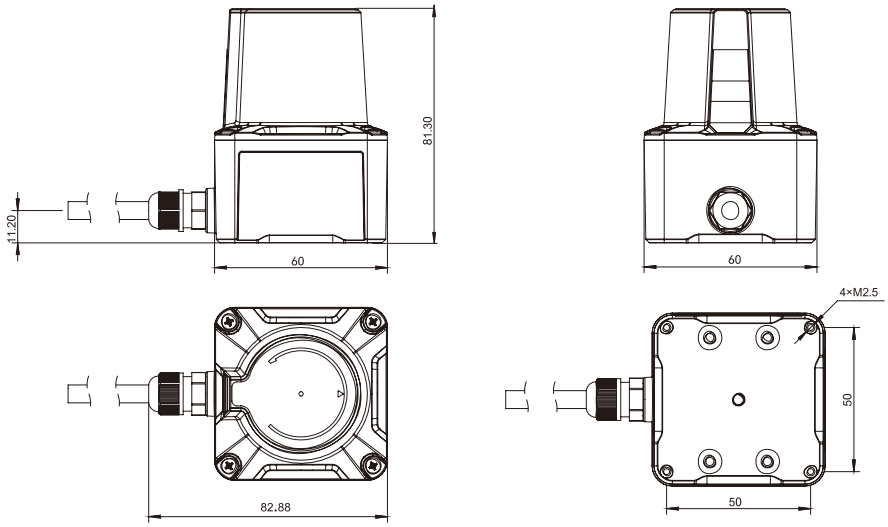
Unit:mm

Dimensions

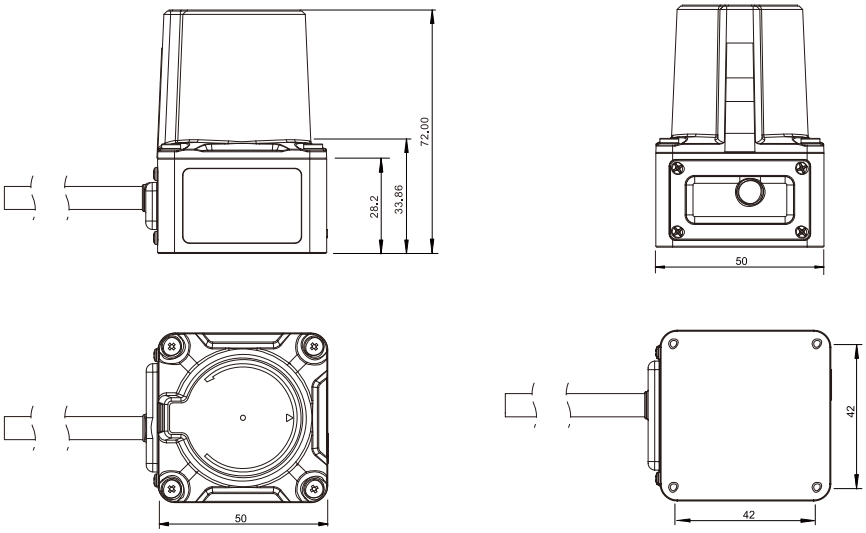
AS-31C



AS-32C



AS-33C



LiDAR Scanner

AS-35C/AS-35CA

TOF principle

NEW!

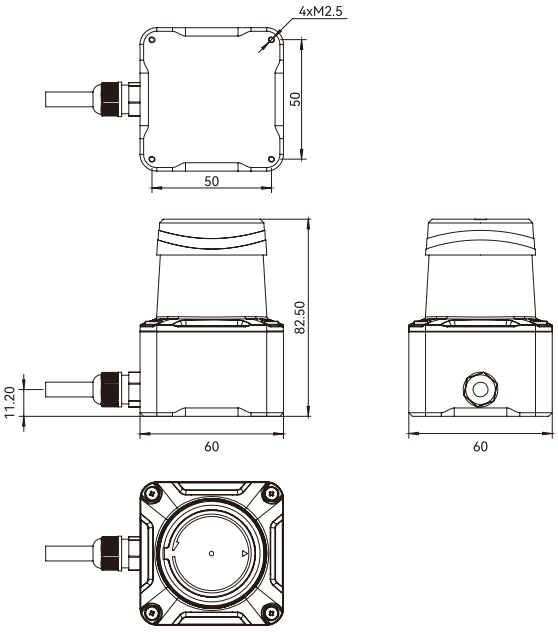
CE

Basic Features	Working principle	TOF	
	Optical working principle	Diffuse Reflection	
	Light source	laser (905nm)	
	Laser spot exit aperture	4.5*2mm	
	Scanning angle	360°(Ranging performance in the area of 10° directly behind is about half of other positions)	
	Scanning angle resolution	0.06°/0.09°/0.12°/0.18°	
	Measuring range	0.2m~50m(90% reflectivity),0.2~18m(10% reflectivity),0.2~6m(2% reflectivity)	
	Measurement error	± 2 cm	
	Indicator	–	
Electrical data	Operating voltage	DC9V~24V	
	Power consumption	<5W/peak, <2W/typical	
	Communication	Ethernet/RJ45	4 holes, M8x1 connector, Ethernet/RJ45 communication
Environmental conditions	Operating temperature	–10℃~50℃(no freezing)	
	Storage temperature	-20℃~60℃	
	Operating humidity	85% or less, non-condensing	
	Ambient Illumination	≤80000 Lux	
	Vibration resistance	500m/s (about 50G), 3 times each in XYZ direction	
	Enclosure rating	IP65	
Mechanical data	Connection	Cable Connection	
	Dimension	82.5x60x60mm	
	Material	Aluminum	
	Weight	about 171 g	
	Accessories	Threaded	
Special function	Sampling frequency	60 kHz 2	
	Power supply	Dc5521 Standard Power Supply	3-hole, M8x1 connector, standard power supply
	Model	**AS-35C**	**AS-35CA**

Unit:mm

Dimensions

AS-35C



AS-35CA