

TOF Principle



Appearance			
Light source		Infrared laser(905nm)	
Laser safety level		Class 1 (GB7247.1-2012, Eye-safe IEC)	
Laser spot light diameter		8mm	
Laser spot light scan angle		12.5 mrad	
Scanning angle range		300°	
Scanning frequency		25Hz(system default)/12.5Hz/6.25Hz	
Scanning angle resolution		0.5° (system default)/0.25° /0.125°	
Sensing range		0.1m ~ 20m	0.1m ~40m
10% reflectivity range		15m	30m
Outdoor performance		Anti-dusty, Anti-sunlight	
Rain fog and smoke penetration		Supported	
Measurement error	System error (typical)	± 5cm	± 5cm (1m~20m) ; ± 10cm (20m~40m)
	Statistical error (1σ)	± 2cm	± 2cm (1m~20m) ; ± 4cm (20m~40m)
Built-in application		Monitoring mode: Point number monitoring / target width monitoring / contour monitoring	
Regional monitoring		Monitor signal level: Attention / warning / alarm	
		Number of regional groups: 16 groups, support self-learning background exclusion	
		Concurrent work area group number: 16 (max)	
		Guide the network camera to monitor the target video positioning and tracking	
Self-test equipment		Contents:Transparent cover dirt / block / high temperature / low temperature Output mode: Indicator + TCP packets	
Ethernet		Rate: 10/100 Mbps; Network protocol: TCP/IP; Function: Device configuration / measurement data output /monitor signal output	
I/O Input		Quantity: 4; Type: Switching level input; High level range: 10V~28V DC; Low level range: 0V~5V DC Preset function: Monitor area selection (0x0 - 0xF); Regional monitoring disarm / forced alarm, active level: high level	
I/O Output		Quantity: 4; Type: PNP switch output ; Output voltage: Supply voltage;Power on: OFF;Device ready (OUT), active state: pass (High level), zone detection signal output (OUT2/OUT3/OUT4) active state: configurable	
Indicator light		Quantity: 2; Definition: ERR (Device alarm: Fault/Abnormal ,Transparent cover dirty / block, high and low temperature, Dense fog); HTR (operation status indication: detection signal / self-learning)	
Front panel button		Quantity: 1; Definition: Shielded monitor signal output / start background self-learning /restart device	
Operating voltage		10V~ 28V DC	
Power		5W(measuring),3.6W@DC 12V/14.4W@DC 24V(heating)	
Outer covering protection rank(IP)		IP65(GB4208-2008)	
Insulation resistance		1M Ω (GB16796-2009.5.4.4)	
Dielectric strength		0.5KV(GB16796-2009.5.4.3)	
Weight		0.6kg	
Dimension(L×W×H)		83.5 × 85 × 104.9(mm)	
Electromagnetic compatibility (EMC)	Electrostatic discharge	6KV (GB/T17626.2-2006, class 3)	
	Fast bursts	1KV (GB/T17626.4-2008, class 2)	
	Electromagnetic field radiation immunity	GB/T17626.3-2006, class 2	
Surge immunity		GB / T17626.5-2008 Power interface: 1.2 / 50 μs, 2KV / 1KA (Class 3) Ethernet interface: 10 / 700 μs, 1KV / 25A (Class 2); I / O interface: 1.5 / 50 μs, 0.5KV / 0.25KA (Class 1)	
Impact		GB/T 2423.5	
Single impact		15g, 11ms	
Continuous impact		10g, 16ms	
Vibration		GB/T 2423.10	
Frequency Range		10Hz~150Hz	
Amplitude		5g	
Humidity		93%, +40℃, 2h (GB/T 2423.3)	
Operating temperature range		-25℃~+50℃	
Storage temperature range		-30℃~+70℃	
Ambient illumination range		≤70,000lux	
Model NO.		AS-21C	AS-41C

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

- Light curtains**
- Standard type
- Top-emitting type
- Side-emitting type
- Waterproof type
- Measuring type
- Economical type
- Safety Light Curtain**
- Beam pitch 10mm
- Beam pitch 20mm
- Beam pitch 30mm
- Beam pitch 40mm

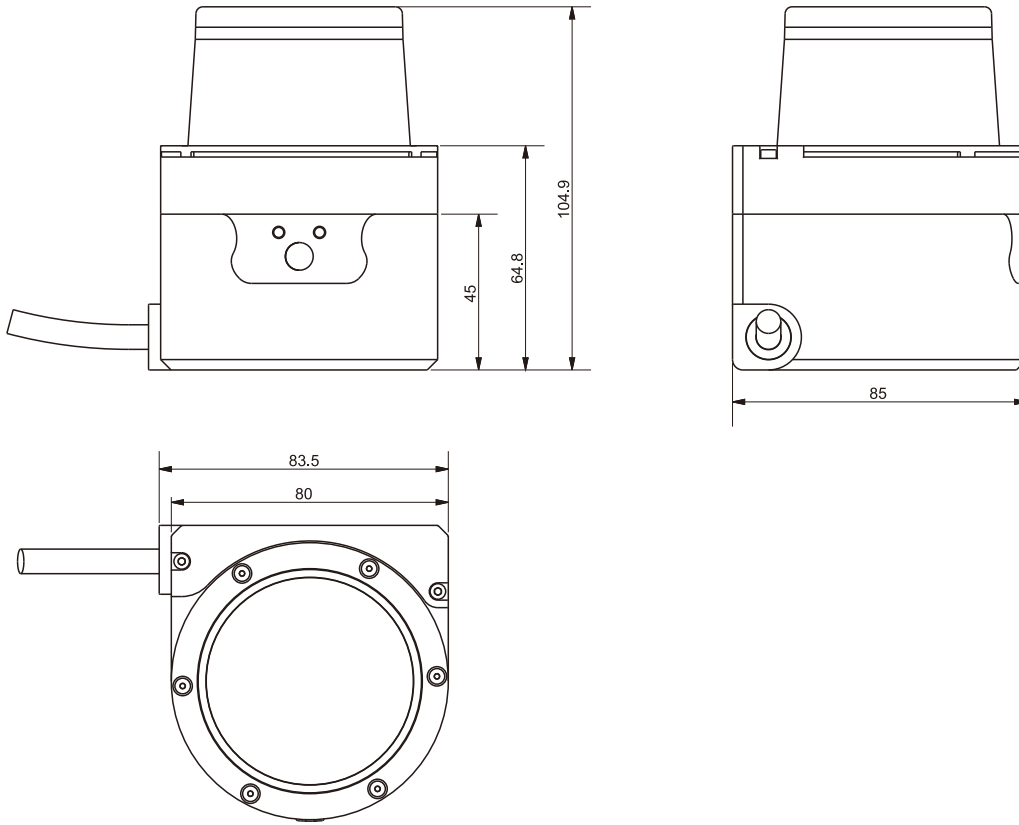
- LIDAR scanner**
- TOF LIDAR scanner
- MINI LIDAR scanner
- Navigation LIDAR

LiDAR Scanner

Dimensions

Unit:mm

Area

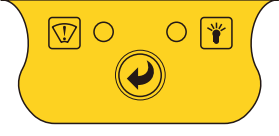





Power Interface

	Socket	Type	Explanation
I/O	DC002	Power	Female 2 pin
Power	Ethernet	RJ45 socket	4 pin
Network port	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

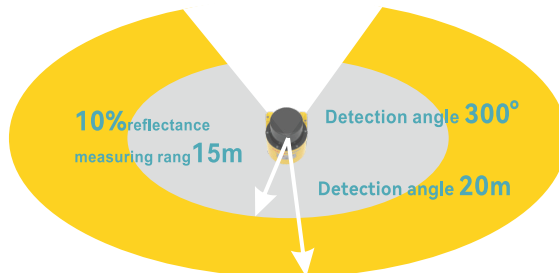
	Name	Instructions
	 ERR	Work fault indicator ◆ Startup state: Light on(About 27s)Always off: No fault ◆ Always on:Internal fault ◆ Always on: Internal fault,Abnormal measurement ◆ Long flicker (0.25Hz) : High / low temperature alarm ◆ Short flicker(1Hz) : Transmissive cover is dirty/occluded ¹
	 HTR	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.

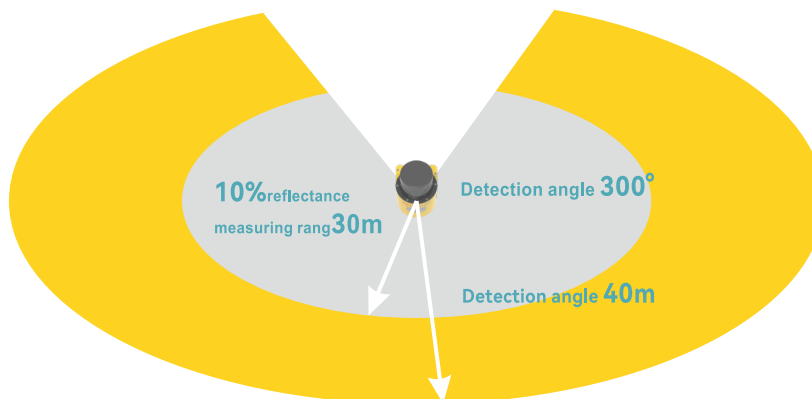
2:Including "background self-learning" and "normal goal self-learning"(customized function).

Measuring coordinate system/scan range/range

AS-21C



AS-41C



- Fiber Optic
- Slot Sensors
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Guidance

- Light curtains
- Standard type
- Top-emitting type
- Side-emitting type
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- Economical type

Safety Light Curtain

- Beam pitch 10mm
- Beam pitch 20mm
- Beam pitch 30mm
- Beam pitch 40mm

LIDAR scanner

- TOF LIDAR scanner
- MINI LIDAR scanner
- Navigation LIDAR

LiDAR Scanner

MINI LiDAR Scanner

TOF principle



Appearance

Light source	Infrared laser(905nm)	
Laser safety level	Class1(GB7247.1-2012, Eye-safe IEC)	
Laser spot light diameter	10mm	
Laser spot light scan angle	10.0(H) 2.0(V)mrad	
Scanning angle range	360°	
Scanning frequency	12.5Hz	
Scanning angle resolution	0.5°	
Sensing range	0.1m ~20m	
10% reflectivity range	15m	
Outdoor performance	Indoor, anti - light, anti - dirt	
Rain fog and smoke penetration	Support	
Measurement error	System error (typical) ± 5cm (1m~15m) Statistical error (1σ) ± 2cm (1m~15m)	
Built-in application	Monitoring mode: point number monitoring / target width monitoring / contour monitoring Monitoring signal type: attention / warning / alarm	
Regional monitoring	Number of regional groups: 16 groups Number of concurrent work area groups: 16 (max)	
Self-test equipment	Can detect targets of any shape, support normal target self-learning function Contents: Dirty cover / blocking / high temperature / low temperature; output method: indicator + TCP message	
Ethernet	Rate: 10/100 Mbps; network protocol: TCP / IP; function: device configuration / measurement data output / monitor signal output	
I/O Input	Quantity: 4; Type: Level input; High level range: 10V~28V DC; Low level range: 0V~5V DC; Preset function: monitoring area selection (0x0 - 0xF); area monitoring disarm / force alarm, effective level: high level;	
I/O Output	Quantity: 4; Type: PNP switch output; Output voltage: power supply voltage; Power-on state: off; Device ready (OUT), valid state: on, zone detection signal output (OUT2 / OUT3 / OUT4) valid state: configurable	
Indicator light	Quantity: 2; Definition: ERR (equipment alarm: failure / abnormality, dirty / transparent cover, high and low temperature, dense fog); HTR (operation status indication: detection signal / self-learning)	
Operating voltage	12V~28V DC	
Power	4.5W@DC 24V	
Outer covering protection rank(IP)	IP65(GB4208-2008)	
Insulation resistance	1M Q (GB16796-2009.5.4.4)	
Dielectric strength	0.5KV(GB16796-2009.5.4.3)	
Weight	0.5kg	
Dimension(L×W×H)	86.0 × 85.0 × 59.5(mm)	
Electromagnetic compatibility (EMC)	Electrostatic discharge	6KV (GB/T17626.2-2006, Class 3)
	Fast bursts	1KV (GB/T17626.4-2008, Class 2)
	Electromagnetic field radiation immunity	GB/T17626.3-2006, Class 2
Surge immunity	GB/T17626.5-2008; Power interface: 1.2/50 μs, 2KV/1KA (Class 3) ; Ethernet interface: 10/700 μs, 1KV/25A (Class 2) ; I/O interface: 1.5/50 μs, 0.5KV/0.25KA (Class 1) ;	
Impact	GB/T 2423.5	
Single impact	15g, 11ms	
Continuous impact	10g, 16ms	
Vibration	GB/T 2423.10	
Frequency Range	10Hz~150Hz	
Amplitude	5g	
Humidity	93%, +40°C, 2h (GB/T 2423.3)	
Operating temperature range	-10°C~+45°C	
Storage temperature range	-30°C~+70°C	
Ambient illumination range	≤70,000lux	
Model NO.	AS-11C	

Area

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Light curtains

Standard type

Top-emitting type

Side-emitting type

Waterproof type

Measuring type

Economical type

Safety Light Curtain

Beam pitch 10mm

Beam pitch 20mm

Beam pitch 30mm

Beam pitch 40mm

LIDAR scanner

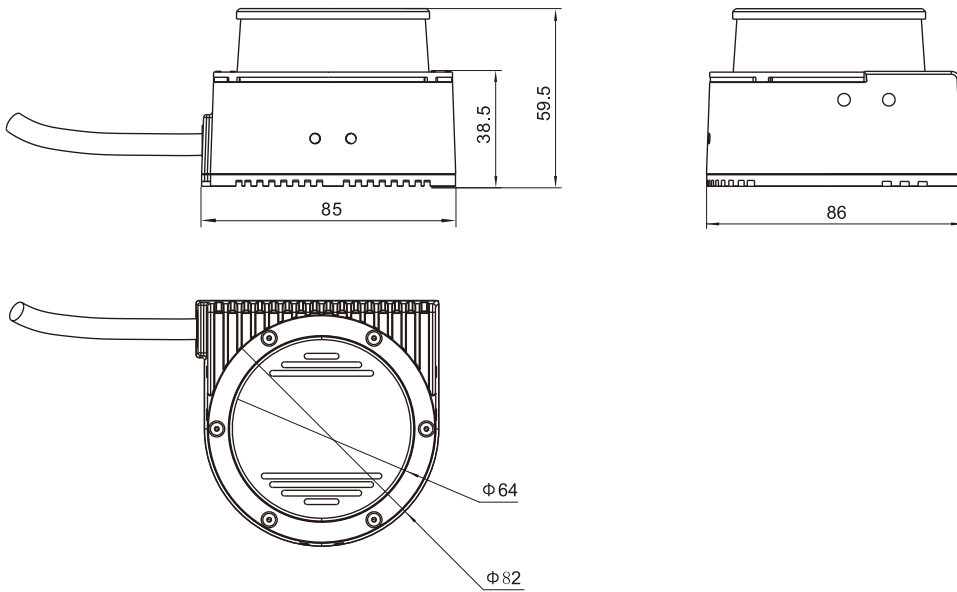
TOF LIDAR scanner

MINI LIDAR scanner

Navigation LIDAR

Unit:mm

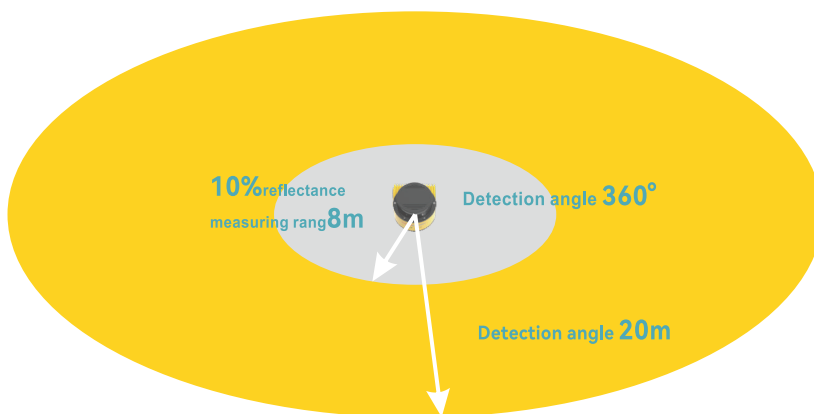
Dimensions



Power Interface

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

Accessories



Area

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Safety Light Curtain

- Beam pitch 10mm
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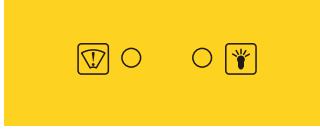


LiDAR scanner

- TOF LiDAR scanner
- MINI LiDAR scanner
- Navigation LiDAR

LiDAR Scanner

Indicators and Operation Buttons

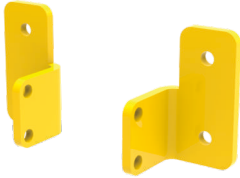


Area

	Name	Instructions
	 ERR	Work fault indicator <ul style="list-style-type: none"> ◆ 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/occluded¹
	 HTR	Work status indicator <ul style="list-style-type: none"> ◆ 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-learning² ◆ Flashing 3 (2.5Hz) : Ready for self-learning²

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

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

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Safety Light Curtain

Beam pitch 10mm

Beam pitch 20mm

Beam pitch 30mm

Beam pitch 40mm

LIDAR scanner

TOF LIDAR scanner

MINI LIDAR scanner

Navigation LIDAR

TOF principle



Appearance		
Light source	Infrared laser (905nm)	
Laser safety level	Class I (GB7247.1-2012, human eye safety)	
Laser spot light diameter	10mm	
Laser spot light scan angle	2.0(H)×8.0(V)mrad	
Scanning angle range	360°	
Scanning frequency	10Hz/20Hz	
Scanning angle resolution	0.05° /0.1°	
Sensing range	0.2m ~100m	
RSSI Measurement Range	3%~1000% (reflector)	
10% reflectivity range	20m	
Outdoor performance	Anti-sunlight, anti-dirt, support smoke penetration, use under non-rainfall conditio	
Measurement data	Composite data (distance + RSSI)	
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)	
Self-test equipment	Content: Dirty/blocking/high temperature/low temperature of the translucent cover	
Ethernet	Rate: 10/100 Mbps; function: device configuration/measurement data output	
I/O Input	Quantity: 3; Type: level input (vs. general input common ground "GND IN"); high level range: 9V ~ 30V DC; low level range: 0V~0.7V DC; Preset function: power saving and life extension control (In2 / In3), effective level: high lev	
I/O Output	Quantity: 3; Type: PNP switch output (vs. power supply positive terminal); Power-on state: off; Preset function: equipment on Thread (OUT), effective state: op	
Indicator light	Quantity: 4; Definition: PWR: power indicator; LNK: Ethernet indicator; ERR: working failure indicator; HTR: normal measurement indicator	
Operating voltage	9V~30V DC	
Power	5W@DC 24V	
Outer covering protection rank(IP)	IP65(GB4208~2008)	
Insulation resistance	1MΩ (GB16796~2009.5.4.4)	
Dielectric strength	0.5KV(GB16796~2009.5.4.3)	
Weight	0.7kg	
Dimension(L×W×H)	97.0×97.0×72.0(mm)	
Electromagnetic compatibility (EMC)	Electrostatic discharge	6KV (GB/T17626.2~2006, Class 3)
	Fast bursts	1KV (GB/T17626.4~2008, Class 2)
	Electromagnetic field radiation immunity	GB/T17626.3~2006, Class 2
Surge immunity	GB/T17626.5~2008; Power interface: 1.2/50μs, 2KV/1KA (Class 3) ; Ethernet interface: 10/700μs, 1KV/25A (Class 2) ; I/O interface: 1.5/50μs, 0.5KV/0.25KA (Class 1) ;	
Impact	GB/T 2423.5	
Single impact	15g, 11ms	
Continuous impact	10g, 16ms	
Vibration	GB/T 2423.10	
Frequency Range	10Hz~150Hz	
Amplitude	5g	
Humidity	93%, +40°C, 2h (GB/T 2423.3)	
Operating temperature range	-10°C~+50°C	
Storage temperature range	-30°C~+70°C	
Ambient illumination range	≤80,000lux	
Model NO.	AS-100C	

Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
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Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories

Guidance

Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm

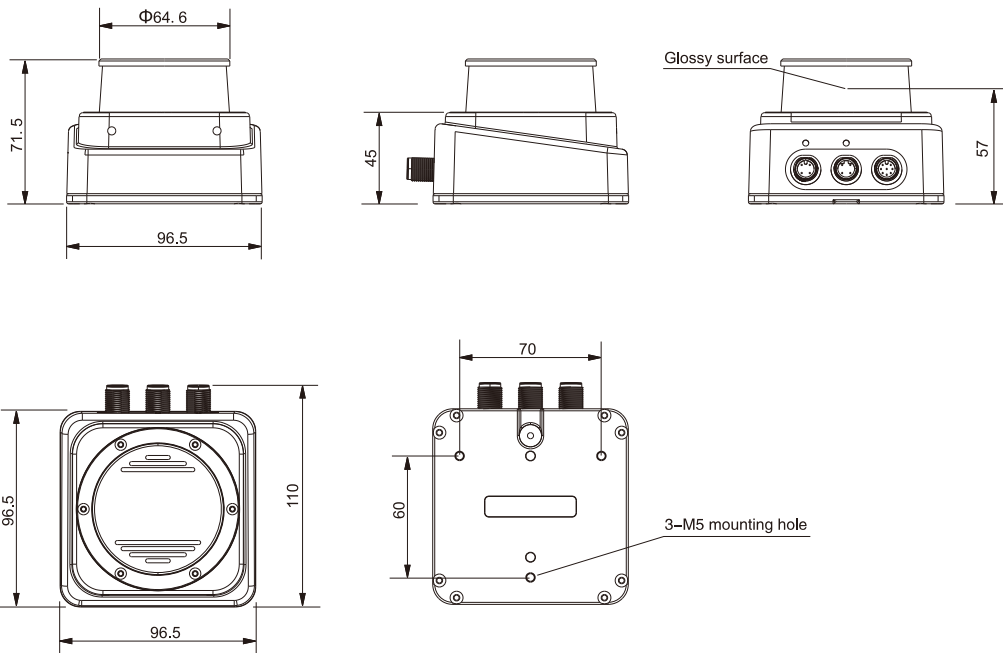
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR

LiDAR Scanner

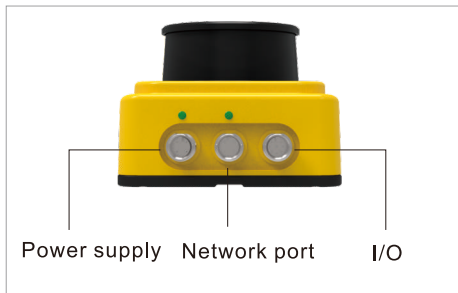
Dimensions

Unit:mm

Area

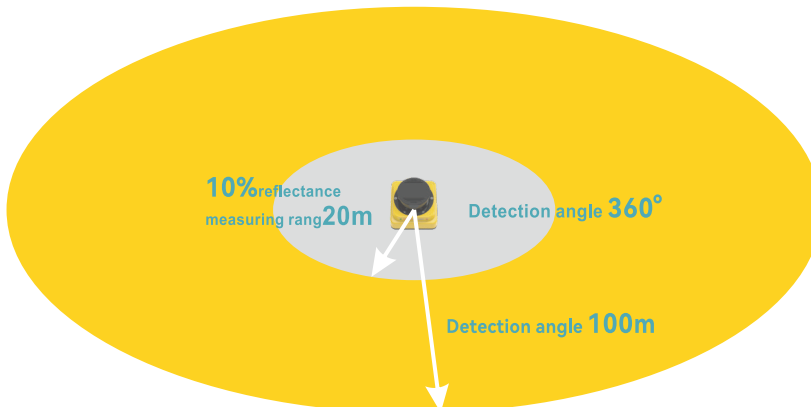


Power connector



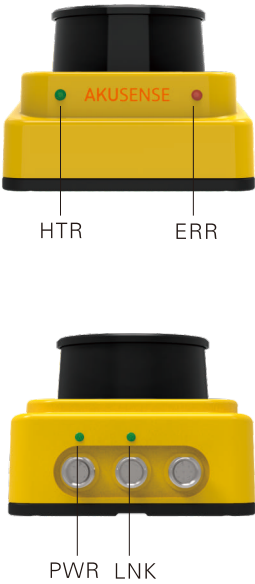
Socket	Types	Number of terminal
Power supply	M12(Type A), Male	4
Etherne	M12(Type B), Male	4
I/O	M12(Type B), Male	8

Measuring coordinate system/scanning range/range








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Indicator Lights 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 ◆ Long flashing (0.5Hz): high temperature/low temperature alarm ◆ Short flashing (1Hz): Dirty/obstructed light transmission cover
	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-ECA	RJ45 network cable: AS-100C-RJ45 A	I/O cable: AS-100C-IOCB A	Parts and accessories: M5x8 set

Guidance

- Light curtains**
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Safety Light Curtain

- Beam pitch 10mm
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- Beam pitch 40mm

LIDAR scanner

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- Navigation LIDAR

LiDAR Scanner

AS-31/32C

TOF Principle

Area



Appearance

Light source	Infrared Laser(905nm)	
Laser safety level	Class 1 (Eye-safe IEC)	
Light spot size	7*3mm	4.5*2mm
Spot scanning angle	5.2*9mrad	4.0*2mrad
Scanning angle range	270°	
Sampling frequency	30KHz	
Scanning frequency	10Hz/15Hz/20Hz/25Hz/30Hz	
Scanning angle resolution	0.12° /0.18° /0.23° /0.35°	
Measuring range (70%reflectivity range)	0.1m ~20m	
Measuring range (10%reflectivity range)	0.1m – 10m	
Function	Navigation	
Operating environment	Indoor	
Measurement error	Resolution	1cm
	Linearity	2cm
Linearity	YES	
Abnormal Alarming	YES	
Communication	Ethernet/RJ45	
Operating voltage	DC12V	DC 9–28V
Power consumption	5W	
Degree of protection	IP65(GB4208–2008)	
Weight	0.25kg	
Dimension (L*W*H)	60 × 60 × 84.9(mm)	60 × 60 × 81(mm)
Electromagnetic compatibility (EMC)	Electrostatic discharge	6KV (GB/T17626.2~2006, Class 3)
	Fast bursts	1KV (GB/T17626.4~2008, Class 2)
	Electromagnetic field radiation immunity	GB/T17626.3~2006, Class 2
Insulation resistance	100MΩ, based on megger 500V DC	
Surge resistance	Power supply 1KV	
Impact resistance	10 to 150Hz, 1.5mm double amplitude for 2 hours each in X, Y and Z directions	
Vibration resistance	500m/s(about 50G), 3 times each in X, Y and Z directions	
Storage humidity	93%, +40°C, 2h (GB/T2423.3)	
Operating temperature	–20°C~60°C	
Storage temperature	–20°C~70°C	
Ambient illuminance	80,000Lux	
Model No.	AS-31C	AS-32C

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LIDAR scanner
TOF LIDAR scanner
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Navigation LIDAR



Appearance	
Sensing principle	TOF
Laser wavelength	905 nm
Max. Sensing range	10 m (70% reflectivity)/4 m (10% reflectivity)
Scanning angle range	270°
Sampling frequency	18 KHz / 54 KHz
Scanning frequency	25 Hz
Resolution	0.5°
Measuring accuracy	± 2 cm (within the range of 10 m)
Response time	40 ms
Startup relay	< 10 s
Channels	64 channels (each channel contains 3 detected areas)
Detection output delay	0 – 2 s , adjustable
Detection delay	0 – 2 s , adjustable
Detected size	0 – 5° , size
Switch input	Quantity: 6 (NPN)
Switch output	Quantity: 4 (3 for area signal, 1 for warning)
Indicator	Quantity: 4 (3 for area signal, 1 for warning)
Communication interface	USB–TYPE C (serial port)
Operating voltage	DC 9 V – 28 V
Power consumption	Power Rating: < 1 W (no load) Starting power: < 3 W (no load)
Working temperature	–10 °C to 50 °C
Storage temperature	–20 °C to 70 °C
Humidity	Less than 85%, non–condensing
Protection degree	IP65
Ambient brightness	80000 Lux
Weight	171 g
Size	50 mm(L) * 50 mm(W) * 72 mm(H)
Model	AS-33C

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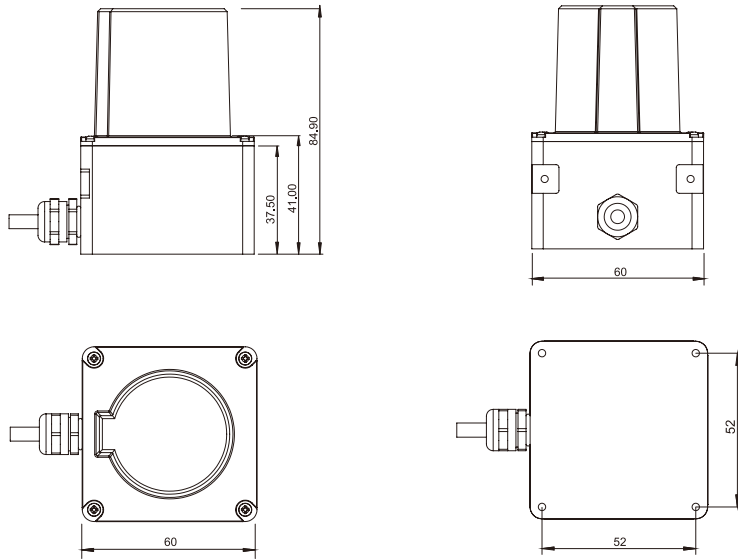
LiDAR Scanner

Unit:mm

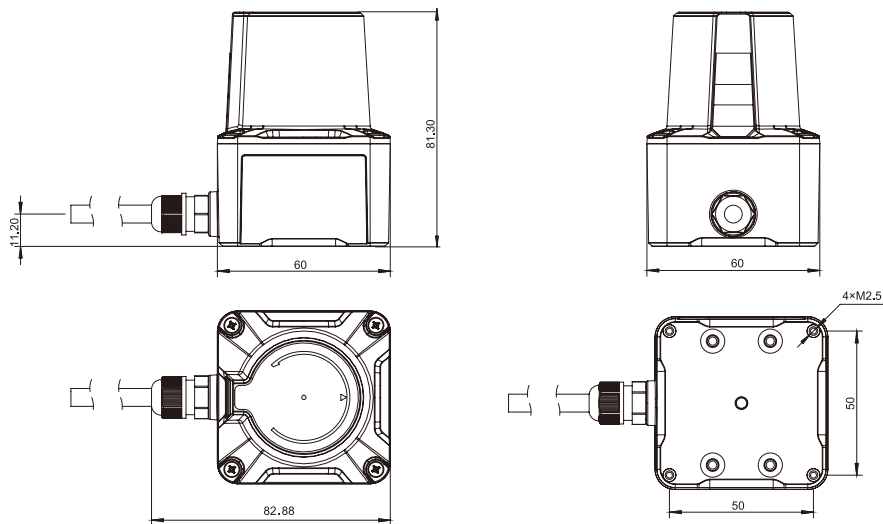
Dimensions

Area

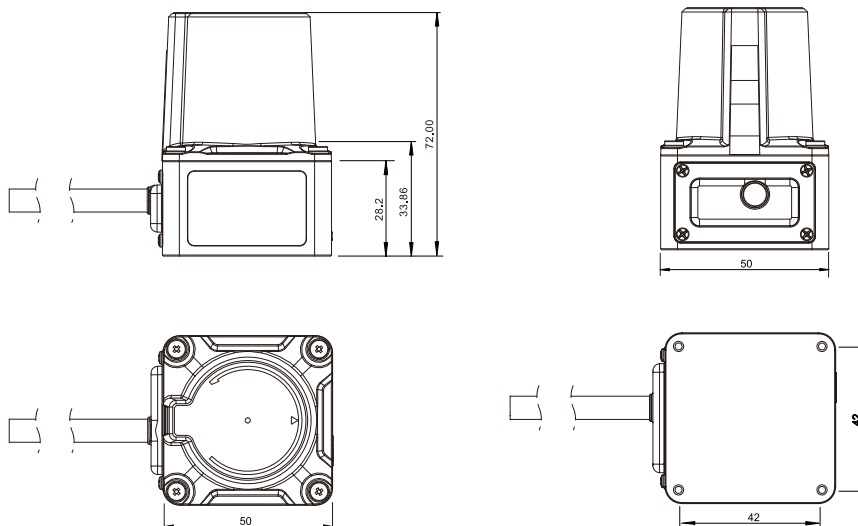
AS-31C



AS-32C



AS-33C



Fiber Optic
Slot Sensors
Photoelectric
Laser
Proximity
Displacement
Magnetic
Contact
Area
Ultrasonic
Vision
Code Readers
Vibration
Temperature
Accessories
Guidance
Light curtains
Standard type
Top-emitting type
Side-emitting type
Waterproof type
Measuring type
Economical type
Safety Light Curtain
Beam pitch 10mm
Beam pitch 20mm
Beam pitch 30mm
Beam pitch 40mm
LIDAR scanner
TOF LIDAR scanner
MINI LIDAR scanner
Navigation LIDAR