

ASR100 Side Radar User Manual



AUTEL[®]

Autel Intelligent Automobile Co., Ltd

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IMPORTANT

Before operating or maintaining this unit, please read this manual carefully, paying extra attention to the safety warnings and precautions.

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For technical assistance in all other markets, please contact your local distributor.

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1. ASR100 Side Radar Introduction

ASR100 is a millimeter-wave radar based on the 77 GHz frequency band, with an ultra-wide field of view. The millimeter-wave radar can accurately measure the target distance, speed, angle, and other information through the difference in echoes between the transmitting and receiving electromagnetic waves. It is an all-weather and all-day operational radar system. The millimeter-wave radar warns the driver of any dangerous target in the blind spot and reminds the driver to make timely adjustments to the driving trajectory to avoid accidents.

The ASR100 millimeter-wave radar has 180° target detection coverage, with a large detection range of up to 80m. It comes with collision pre-determination and graded alarm function, can integrate with external CAN (Controller Area Network) and CAN FD (Flexible Data) interfaces, and supports 12V or 24V supply voltage. The radar features a compact structure and superior performance, is highly cost effective and easy to install, and can meet forward, side, and reverse obstruction warning requirements for passenger and commercial vehicles.

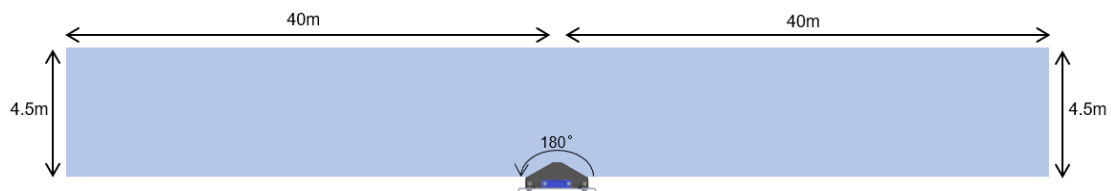


Figure 1: An Example of the detection range of ASR100 radar (4.5 meter is limited by software)

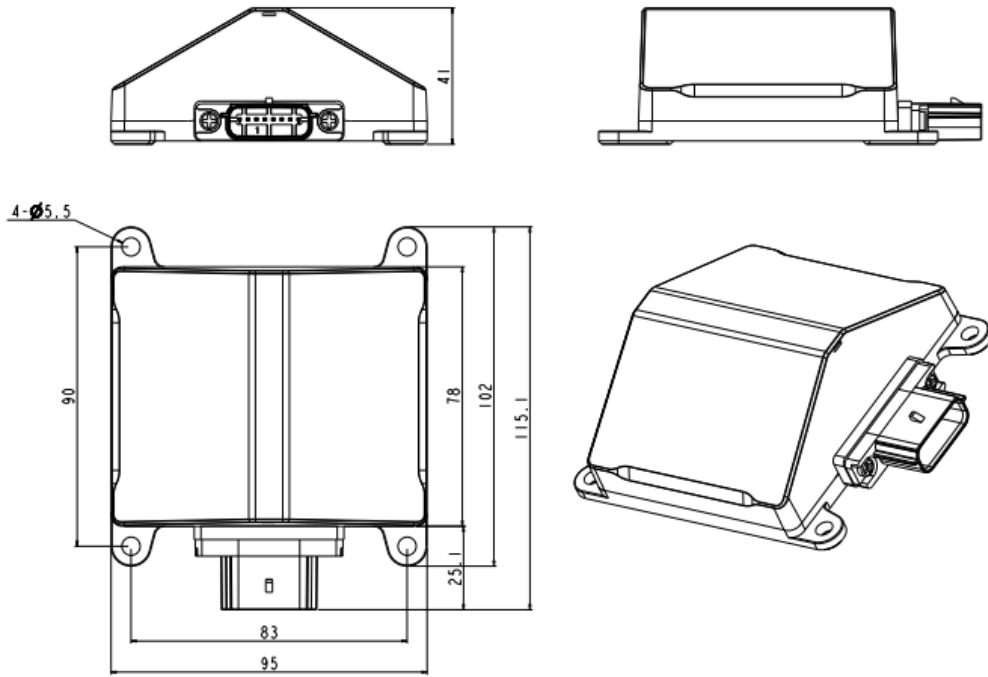


Figure 2 Outline diagram of millimeter-wave radar

Note: The default cable included is 8 m in length.

2. Precautions for Product Use

Please read the precautions carefully before use, to avoid any problems with the product or its usage.

- (1) While installing, ensure the device is not powered on.
- (2) Please follow the installation instructions for the radar sensor to avoid the installation error exceeding the error limit.
- (3) ASR100 millimeter-wave radar performs automatic fault detection after power-on. If there is a fault, please do not use it.
- (4) Be sure to conduct the test in an outdoor open field and pay attention to the safety of vehicles and personnel.

If you encounter problems that cannot be resolved, please contact Autel's customer service staff. We will diligently help you resolve the problem at the earliest!

3. Packing List

The packing list includes: millimeter-wave radar sensor (as shown in Figure 3), 1 connecting cable (as shown in Figure 4), a spirit level (as shown in Figure 5), and

several fixing screws. The mounting bracket can be purchased separately according to customer needs. The mounting bracket is not supplied with the radar by default.

Note: The radar and the bracket can be fixed with 4 M2.5 screws.

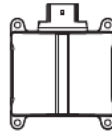


Figure 3 Millimeter-wave radar sensor

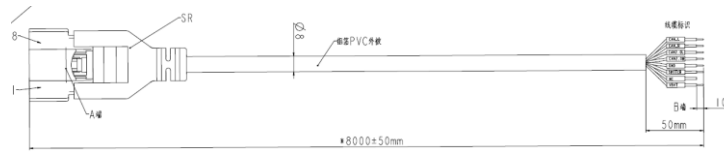


Figure 4 One connecting cable (8 m, 8 pin or 6 pin)



Figure 5 Spirit level

4. How to Use

4.1 Connecting cable interface

The ASR100 millimeter-wave radar provides a 8 pin or 6 pin wire harness according to customer needs. The 8 pin cable is illustrated schematically in Figure 6 below:

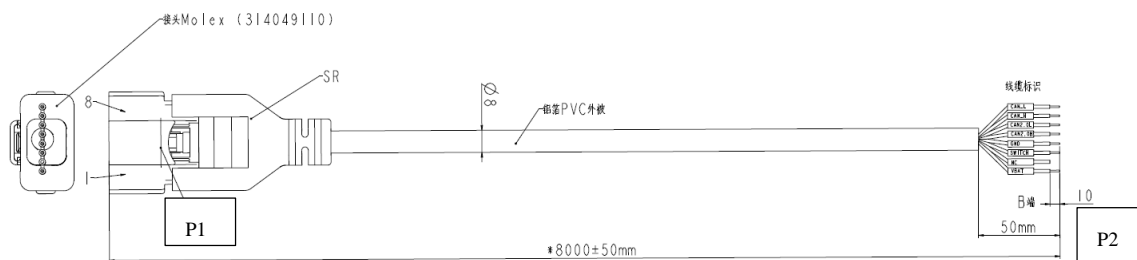


Figure 6 Schematic illustration of the 8 pin connecting cable

In the figure above, the P1 connector is connected to the radar; it has 8 pins and the pin number corresponds to the pin definition in Table 1. The P2 connector is connected to the vehicle and power supply, the end of each cable has a printed label.

Please check it carefully during installation. Do not turn the power on if the connectors are improperly connected.

Table 1: Definition of each pin of the 8 pin cable

No.	Definition	Range	Cable color
1	VCC	8~32V DC	Red
2	NC	Open circuit	Orange
3	Switch	24V/0V DC	Blue
4	GND	0V DC	Black
5	CAN2.0_H	-58~58 V DC	Green
6	CAN2.0_L	-58~58 V DC	Yellow
7	CAN_H	-58~58 V DC	White
8	CAN_L	-58~58 V DC	Purple

The 6 pin cable is illustrated schematically in Figure 7 below:

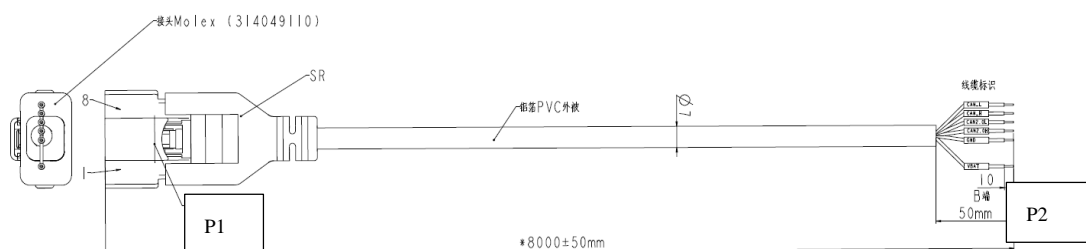


Figure 7 Schematic illustration of the 6 pin connecting cable

In the figure above, the P1 connector is connected to the radar; it has 6 pins and the pin number corresponds to the pin definition in Table 2. The P2 connector is connected to the vehicle and power supply, the end of each cable has a printed label. Please check it carefully during installation. Do not turn the power on if the connectors are improperly connected.

Table 2: Definition of each pin of the 6 pin cable

No.	Definition	Range	Cable color
1	VBAT	8~32V DC	Red
2	GND	0V DC	Black
3	CAN2.0_H	-58~58 V DC	Green
4	CAN2.0_L	-58~58 V DC	Yellow
5	CAN_H	-58~58 V DC	White
6	CAN_L	-58~58 V DC	Purple

4.2 ASR100 side radar connection relationship

When the ASR100 millimeter-wave radar is used, the radar module is normally powered by the vehicle power supply, the main communication interface of the radar is the CAN interface connection. The radar outputs detection and warning information to the client.

4.3 ASR100 side radar installation and calibration

Radar Installation

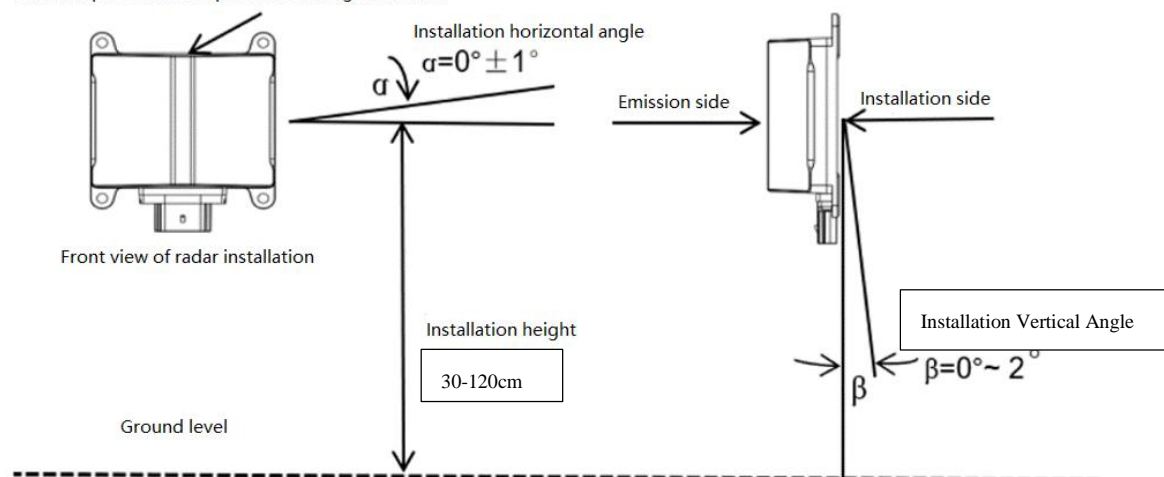
Installation position: The radar should be installed on the right side of the truck. For right rudder country please install on the left side of the truck. We recommend you install it on the side guard plate, side guard rail of the truck.



Installation height: We recommend you install the radar at a height of 30-120 cm above ground.

Installation deviations: To ensure detection accuracy, the radar installation horizontal angle error should be within $\pm 1^\circ$. Installation vertical angle error should be within 2° .

Plane for placement of spirit level during calibration

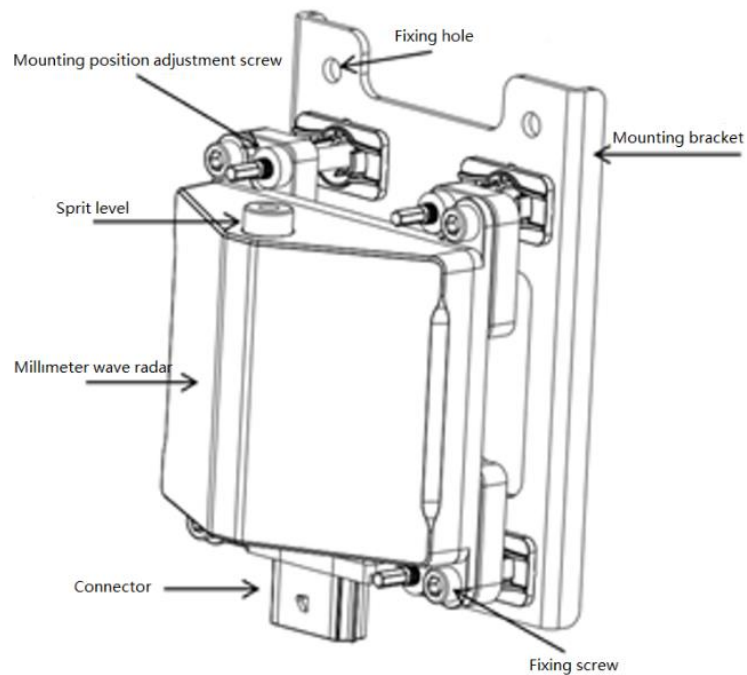


Example of Installation

In order to control installation deviations, an optional auxiliary mounting bracket can

be used to adjust the direction and angle during installation.

1. With the front of the radar (the side with the plastic casing) facing the detection area, fix the radar to the mounting bracket using the screws.
2. Place the spirit level in the middle of the upper plane of the radar and adjust the mounting position adjustment screw until the bubble overlaps the ring in the middle.
3. Secure the mounting position adjustment screw, and then connect the cable.



Radar Wiring

After the radar cable is connected to the radar, it should be routed into the cab together with the chassis cable, as shown in the image below.



The entry for the chassis cable into the cab is at the bottom of the cab. Therefore, you need to lift the cab during wiring, as shown in the image below.



In front of the front passenger seat (where the main fuse and the main ECU are located), connect the power supply, the display screen and the other parts of this product, as shown in the image below.



Input Signal Access

The Autel ASR100 requires the 5 interior signals below for its normal operation. The radar automatically reads these CAN J1939 signals by default:

1. Vehicle speed
2. Steering wheel angle
3. Yaw rate
4. Longitudinal acceleration
5. Lateral acceleration

Identifier	Tmin	Tmax	Message Type	Byte Oder
0xCFE6CEE	50ms	50ms	cyclic	Intel

Signal	Byte	Bit	Length	Resolution	Offset	Minimum	Maximum	Unit
Vehicle Speed	6	48	16	0.00390625	0	0	250.996	km/h

Identifier	Tmin	Tmax	Message Type	Byte Oder
0xCF0090B	20ms	20ms	cyclic	Intel

Signal	Byte	Bit	Length	Resolution	Offset	Minimum	Maximum	Unit
Steering	0	0	16	0.055952	-1797.6	-1797.6	1797.6	deg

Wheel Angle								
YawRate	3	24	16	0.00699088	-224.6	-224.6	224.6	deg/s
Lateral acceleration	5	40	16	0.000488273	-15.687	-15.687	15.687	m/(s*s)
Longitudinal acceleration	7	56	8	0.1	-12.5	-12.5	12.5	m/(s*s)

Installation and Risk Notes

5.1 Installation precautions

1. When the radar sensor is installed, the triangular surface (plastic casing surface) should face the detection area, and the left and right sides and the front should not be blocked by any metal objects.
2. It is not recommended to install the radar on the vehicle's protective cover.
3. The radar should be installed at a position far from where other equipment are frequently operated
4. The radar should be installed away from high heat sources such as motor actuators and drivers.

5.2 Notes on usage risks

1. When there are foreign objects such as mist, ice particles, snow or cement on the surface of the radome, please clean it before use.
2. The radome should only be wiped with a damp, lint-free cotton cloth; do not scratch or damage the surface of the radome.
3. Welding should not be conducted near the sensor location.
4. Inspect the device daily before use.