ASR110 Side Radar

User Manual V1.0

AUTEL®

Autel Intelligent Tech. Corp., 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.

For Services and Support

Web: www.auteltech.cn

Email: Support@auteltech.net

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

Revision History

Date	Version	Version description
2021-09-05	1.0	ASR110 Side Radar User Manual Version 1.0

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1. ASR110 Side Radar Introduction

ASR110 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 ASR110 millimeter-wave radar has 180°target detection coverage, with a large detection range of up to 80 x 4.5 m. 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.
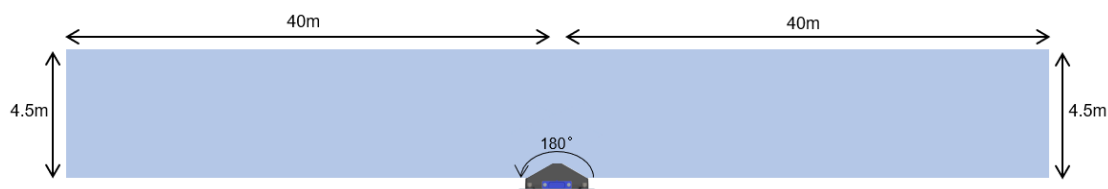

Figure 1 Diagram of the detection range of ASR110
radar Table1：performance index

frequency	76-77GHz	Max rang	±80m（vehicle） ±40m（VRU）
Distance accuracy	±0.16m	Min rang	0.25m
Speed range	0~±60km/h	Speed accuracy	±0.43km/h
FOV	180°	Angular accuracy (azimuth)	±0.8°
Sizes	115X95X41mm	Max ERIP	26.74 dBm
temperature	-40℃~85℃	Max power consumption	6.5W
weight	230g	safe distance	Greater than 4.5 cm
Accessories	bubble level, mounting bracket, cable, warning screen		
Manufacturer	Autel Intelligent Tech. Corp., Ltd.		
Address	7th-8th,10th Floor, Building B1, Zhiyuan, Xueyuan Rd, Xili, Nanshan, Shenzhen, 518055 China		

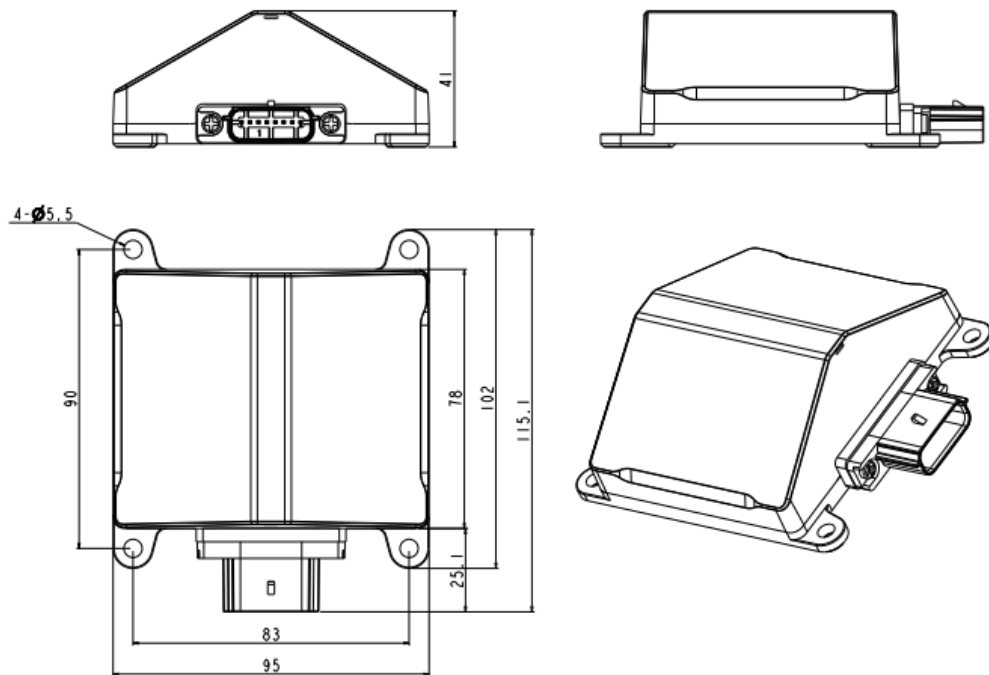| EU Importer	Autel Europe GmbH
Address	Landsberger Str. 408 4.OG, 81241 München, Germany

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) Match the mounting bracket based on the product model. If the mounting bracket does not match the product model after purchase, please promptly contact our customer service for replacement.

(3) Please follow the installation instructions for the radar sensor to avoid the installation error exceeding the error limit.

(4) ASR110 millimeter-wave radar performs automatic fault detection after power-on. If there is a fault, please do not use it.

(5) 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!

Notice:

In order to protect human health, this device meets the thresholds for exposure of the general public to electromagnetic fields according to Council Recommendation 1999/519/EC. This device should be installed and operated with at least 20 cm between the radiator and your body.

The output power of the radio technology used in the Device is below the radio frequency exposure limits set by the FCC. This device should be installed and operated with a minimum distance of 20cm between the radiator and your body.

Important: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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)

Figure 5 Spirit level

4. How to Use

4.1 Connecting cable interface

The detailed interface definitions of the millimeter-wave radar connector pins are described in Table 1 below:

Table:2 Radar connector pins definition:

No.	Definition	Range	Cable color
1	VBAT	8~32V DC	Red
2	NC	Open circuit	Orange
3	NC	Open circuit	Blue
4	GND	0V DC	Black
5	CAN2.0_H	-58~58v DC	Green
6	CAN2.0_L	-58~58v DC	Yellow
7	CANFD_H	-58~58v DC	White
8	CANFD_L	-58~58v DC	Purple

The ASR110 millimeter-wave radar connecting cable is illustrated schematically in Figure 6 below:
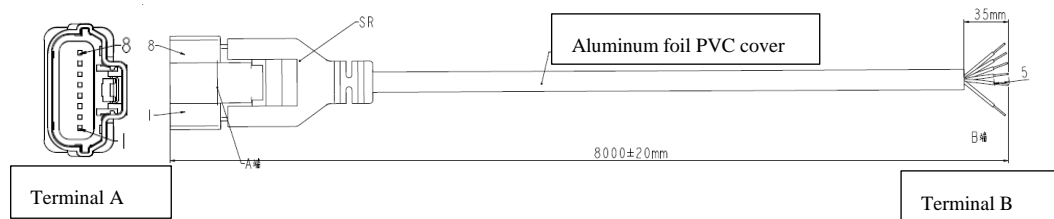

Figure 6 Schematic illustration of the millimeter-wave radar connecting cable

In Figure 6, the Terminal A connector is connected to the radar, it has 8 pins, the pin number in the figure corresponds to the pin definition in Table 1. The Terminal B is connected to the vehicle and host computer. The color of each wire corresponds to terminal A. Please check carefully when installing, and do not power on using an incorrect connection.

4.2 ASR110 side radar connection relationship

When the ASR110 millimeter-wave radar is used, the radar module is powered by the vehicle power supply, and the vehicle and the radar communicate through the CAN interface connection. The radar outputs detection and warning information to the host computer software through the CAN_FD interface. When the radar needs to be

4

upgraded or debugged, the radar and the host computer are connected through the CAN_FD interface. The connection relationship is shown in Figure 7.
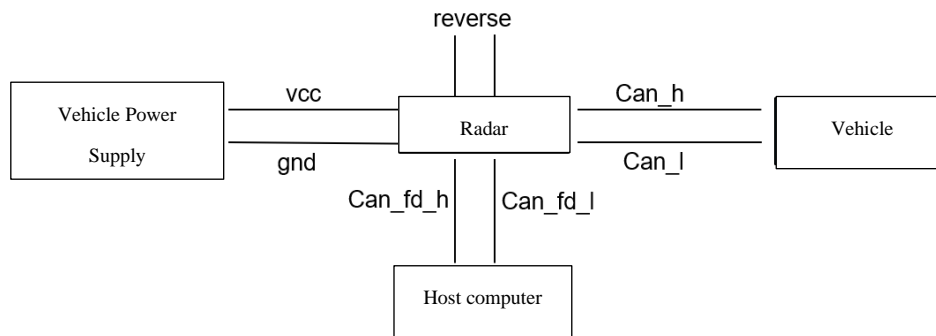

Figure 7 ASR110 radar debugging connection relationship diagram

4.3 ASR110 side radar installation and calibration
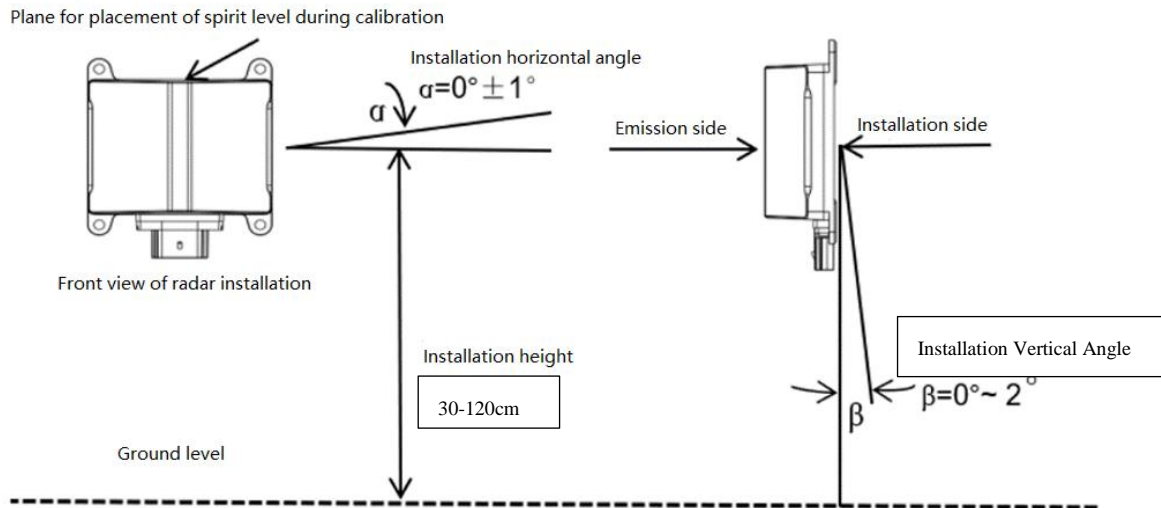
Radar Installation

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 or side fuel tank of the truck.

Note: If you choose to install the radar on the fuel tank on the right side of the truck, you need to purchase the professional mounting bracket.

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 ±1°. Installation vertical angle error should be within 2°.

Plane for placement of spirit level during calibration

Installation horizontal angle
α=0°±1°
α

Emission side   Installation side

Front view of radar installation

Installation Vertical Angle

Installation height

30-120cm

β=0°~ 2°

β

Ground level

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.

Fixing hole

Mounting position adjustment screw

Mounting bracket

Sprit level

Millimeter wave radar

Connector

Fixing screw
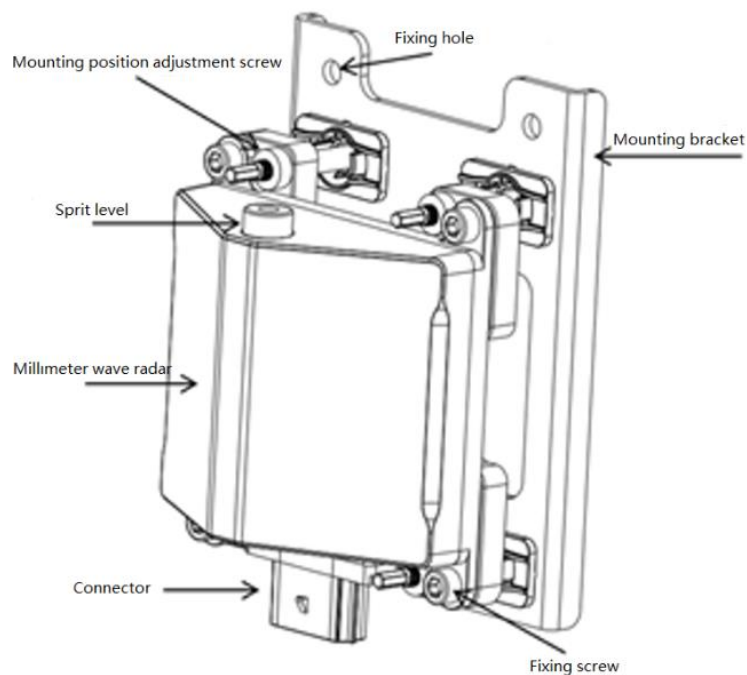
Radar Wiring

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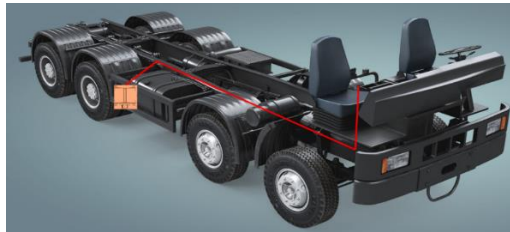
The entry for the chassis cable into the cab is at the bottom of the cab. Therefore, you need to lift the cab during wiring, as shown in the image below.

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.
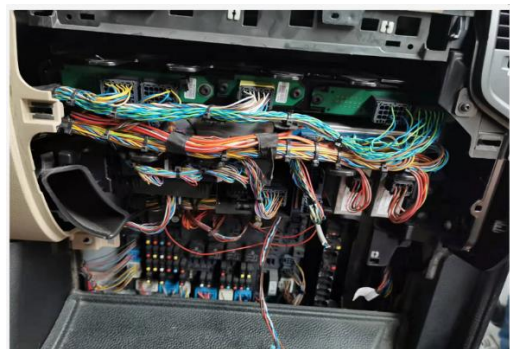

Input Signal Access

The Autel ATS100 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

Power Access

The radar has to be powered via KL15 or Clamp 15 (24V). We recommend you find

KL15 on the main fuse board and connect the radar to it. On a Mercedes-Benz Actros, for instance, KL15 (+) is located on the left side of main fuse board in front of the front passenger seat, and KL31 (−) on the right side, as shown in the image below.
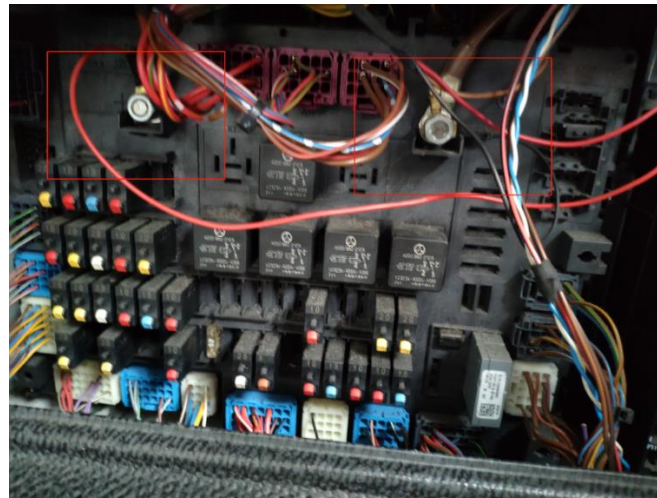
Installation and Risk Notes

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.