Atomsenses Fall Detection Sensor

Product Specification

Applicability

This guide applies to the following Atomsenses products, unless otherwise specified:

Model	Description
ASD8-LN4	- LoRaWAN Fall Detection Sensor

Declaration of Conformity

Atomsenses sensors and other products comply with the essential requirements and relevant provisions of CE/EMC, and RoHS standards.

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Hardware Introduction

ASD8-LN4 is a ranging radar that utilizes millimeter waves, possessing the advantages of high accuracy (at the millimeter level), long detection range, and immunity to the influence of light. The product calculates the target distance by leveraging the time difference between the electromagnetic wave emitted by the radar and the reflected electromagnetic wave received. Consequently, it achieves a higher accuracy rate and is less prone to misses.

Features

Circular Design, Adopting ABS Material for a Lighter, More Robust and Aesthetically Pleasing Shell

Employing 60G Millimeter Wave Radar Technology for More Precise Detection and Stable Operation

Effective Detection Range of 200 - 350CM, with High Sensitivity, Suitable for Use in Unisex Toilets or Bedrooms

RS485/LoRa Communication Modes for Simplified Data Aggregation, and Private Protocol to Prevent Information Leakage

IP65 Design for a Wide Range of Operating Environments and Strong Applicability

Built-in Intelligent Learning Algorithm to Filter Abnormal Fluctuations in Detection and Output Detection Results

Top Wall Mounting Method with Customized Brackets for More Convenient Angle Adjustment and Installation"

Device Appearance

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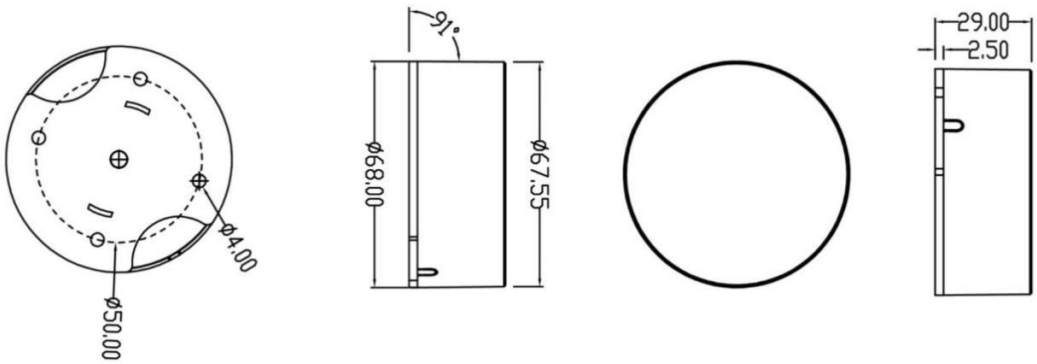
Dimensions(mm)



Technical specifications and standards

Specifications	Parameters
Probe	3D SQT - 60GmmWave Probe
Technology	60G millimeter wave radar technology
Response Time	Less than 1 second
Detection Distance	200 - 400CM
Power Supply	12V,1A
Communication Parameters	9600,8,1
Overall Machine Power Consumption	2.5W
Dimensions	Diameter × Height: 65mm × 25mm
Operating Temperature	-10°C to 60°C
Operating Humidity	5% to 80% RH (without condensation)
Ingress Protection Rating	IP65

Installation

The product is designed for wall mounting.

Firstly, fix the mounting base onto the wall using screws or 3M adhesive, and then the device body can be hung on the base.

The installation height is required to reach 2 meters. Note that fall detection is applicable only to single-person scenarios.

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Instructions For Use

1. Collection distance

The distance is calculated using the time difference between the electromagnetic wave emitted by the radar and the reflected electromagnetic wave received by the radar.

2. Existence judgment

The distance value collected in step 1 is compared with the set threshold value. If the distance is less than the threshold value and continuously exceeds the set number of times, it is considered to exist. If the distance is continuously greater than the threshold value and exceeds the set number of times continuously, it is judged that it does not exist.

3. Parameter setting

Support through the RS485 bus, use the private protocol and the MODBUS protocol to modify the parameters and obtain the current distance value.

Protocol Description

LoRa Protocol

1. Wireless detection device UUID acquisition request and reply

Message function	Field	Length	Explanation	Notes
Request	Device Unique ID	3 bytes	Unique ID number of the device	Slave launch
	Command Field	7bit	1	
		6-1bit	Command type, 0x2b	
		0bit	Keep	
		1 byte	Serial number	
	XOR sum	1 byte	XOR	
Reply	Device Unique ID	3 bytes	Unique ID number of the device	Host initiated
		7bit	0	
		6-1bit	Command type, 0x2c	

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	Command Field	0bit	Keep	
		1 byte	with the serial number of the request command aligned	
		1 byte	Device Type	
		1 byte	Wireless Band	
	XOR sum	1 byte	XOR	

2. Sensor data active acquisition request and reply

Message function	Field	Length	Explanation	Notes
Request	Device Unique ID	3 bytes	Unique ID number of the device	Host initiated
	Command Field	7bit	0	
		6-1bit	Command type, 0x2d	
		0bit	0 reserved	
	XOR sum	1 byte	XOR	
	Device Unique ID	3 bytes	Unique ID number of the device	

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Reply	Command Field	7bit	1	Slave launch
		6-1bit	Command type, 0x2e	
		0bit	0 reserved	
		1 byte	Number of channels	
		7-2bit	Channel type	
		1-0bit	Number of decimal points	
		4 bytes	Channel data	
	XOR sum	1 byte	XOR	

illustrate:

The number of channels is the number of data, and the number is 1 if there is only distance.

The channel type is 17, which represents the distance value in centimeters.

The channel data is an integer, high byte first. Integer is the value that the actual data is enlarged according to the number after the decimal point.

The number of decimal points determines the magnification of the channel data filled in 4 bytes. When the number of decimal points is 1, it is magnified by 10 times, when it is 2, it is magnified by 100 times, when it is 3, it is magnified by 1000 times, and when it is 0, it is unchanged.

Decoder:

https://github.com/atomsenses/atomsenses-decoder/blob/main/FallDetectorDecoder.js

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