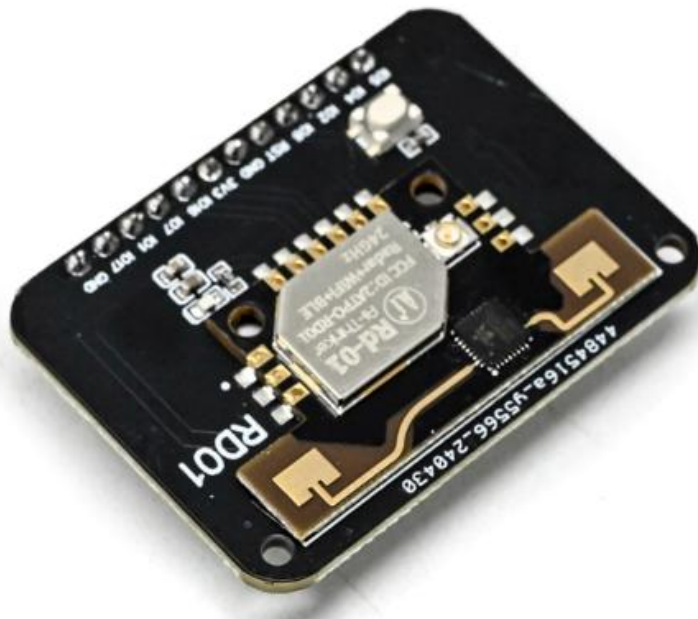




SmartElex Ai-Thinker RD-01 Radar Module



The SmartElex Ai-Thinker RD-01 Radar Module a 2.4GHz mmWave radar sensor designed for human presence detection. It utilizes FMCW (Frequency Modulated Continuous Wave) technology to detect both moving and stationary human targets within a range of up to 5 meters. The sensor integrates Wi-Fi and BLE capabilities, allowing for wireless configuration and data transmission. It supports UART communication for integration with microcontrollers. For more information,

Technical Parameters

INTERFACE UART (115200 baud)	DETECTION RANGE Up to 5 meters	DETECTION FIELD ±60°
POWER SUPPLY 3.0-3.6V DC	OUTPUT UART, Wi-Fi, BLE	OPERATING TEMPERATURE -40°C to +85°C
DIMENSIONS 35mm × 18mm × 3.6mm	PIN WIDTH 1.25mm	

PINOUT DIAGRAM

Primary

5 Total Pins

PIN TYPES	
⚡ Power	2
🔌 Control	1

QUICK TIPS

24GHz FMCW mmWave radar technology, [object Object] [object Object]

⚠️ 3.3V ONLY - do not use 5V power or logic, CHIP_EN must be HIGH - cannot be left floating

Integrated Wi-Fi and BLE capabilities, Detects both moving and stationary targets

Pin Descriptions

PIN NAME	TYPE	DESCRIPTION	NOTES
1 3V3	Power	Power input (3.3V ONLY). Do not exceed 3.6V.	⚠ 3.3V only - exceeding voltage will damage the module.
2 GND	Power	Ground reference. Must be shared with ESP32.	Common ground essential for signal integrity.
3 TX	UART	UART transmit pin. Outputs presence and motion data.	Connect to ESP32 RX pin (e.g., GPIO 16). 3.3V logic.
4 RX	UART	UART receive pin. Accepts configuration commands.	Connect to ESP32 TX pin (e.g., GPIO 17).
5 CHIP_EN	Control	Chip enable (active high). MUST be pulled HIGH for operation.	⚠ REQUIRED: Tie to 3.3V or control with GPIO. Cannot be left floating.

Interfacing with ESP32:

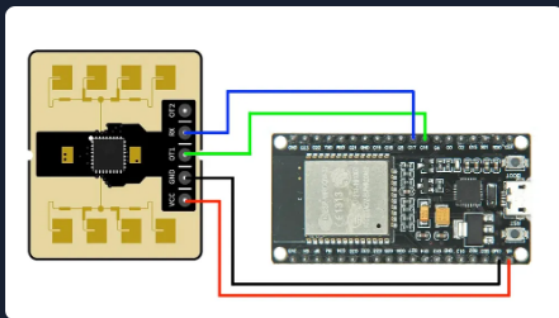
Wiring RD-01 to ESP32

To interface the RD-01 with an ESP32, connect 3V3 to 3.3V power, GND to ground, TX to GPIO 16 (RX2), RX to GPIO 17 (TX2), and CHIP_EN to 3.3V or a GPIO pin.

Visual Wiring Diagram

WIRING DIAGRAM

Recommended



5 Connections

CONNECTION STATUS

⚠ Required 5

PROTOCOL

UART

Pin Connections			
RD-01 PIN	CONNECTION	ESP32 PIN	DESCRIPTION
1 3V3 (red) Required	→	3.3V	Power supply (3.3V ONLY). Do not use 5V.
2 GND (black) Required	→	GND	Ground connection. Must be common with ESP32.
3 TX (green) Required	→	GPIO 16 (RX2)	Radar transmits data to ESP32.
4 RX (blue) Required	→	GPIO 17 (TX2)	ESP32 sends configuration commands to radar.
5 CHIP_EN (yellow) Required	→	3.3V or GPIO	Enable pin. MUST be HIGH. Tie to 3.3V or use GPIO for control.

GPIO Functionality:

No.	Name	Function
1,11	GND	Ground
2	GPIO17	GPIO17/SPI_MOSI/MISO/IIC_SDA/PWM_CH2/JTAG_TCK/TMS
3	GPIO1	GPIO1/SPI_MOSI/MISO/IIC_SDA/PWM_CH1
4	GPIO2	GPIO2/SPI_SS/IIC_SCL/PWM_CH2
5	GPIO4	GPIO4/SPI_MOSI/MISO/IIC_SCL/PWM_CH4/ADC_CH1
6	GPIO5	GPIO5/SPI_MOSI/MISO/IIC_SDA/PWM_CH0/ADC_CH4/JTAG_TMS/TCK
7	CHIP_EN	By default, it is enabled on the chip. The high level is valid
8	GPIO8	Bootstrap/GPIO8/SPI_MOSI/MISO/IIC_SCL/PWM_CH3
9	GPIO16	TXD/GPIO16/SPI_MOSI/MISO/IIC_SCL/PWM_CH1/JTAG_TMS/TCK
10	GPIO7	RXD/GPIO7/SPI_SCLK/IIC_SDA/PWM_CH2/JTAG_TDO/TDI
12	3V3	3.3V power supply; It is recommended that the output current of the external power supply be at least 500mA

Note: 1. GPIO8 is used as Bootstrap. The instant of power-on is high power level, and the module enters the burning mode; The power-on moment is at low power level, and the module starts normally.

• RD-01 ESP32 – Quick Info

- Chip: **ESP32-WROOM-32**
- Wi-Fi + Bluetooth
- 3.3V logic
- UART programming
- BOOT button required for flashing

• Basic Hardware Connections (USB-TTL)

USB-TTL	RD-01
3.3V	3V3
GND	GND
TX	RX
RX	TX
EN	3.3V (via 10k or direct)
IO0	GND (only while flashing)

Important

- Use **3.3V only**
- Pull **IO0 to GND** while uploading
- Release IO0 and reset after upload

- **Arduino IDE Settings**

- Board: **ESP32 Dev Module**
- CPU Frequency: **240 MHz**
- Flash Mode: **QIO**
- Flash Size: **4MB**
- Upload Speed: **921600**
- Port: Your COM port

- **Common Problems & Fix**

Problem	Solution
Upload stuck	Hold BOOT , press RESET
No COM port	Install CP2102 / CH340 driver
Garbage serial	Set 115200 baud
Reset loop	EN pin floating → pull up

Visit to Site :: https://en.ai-thinker.com/pro_view-125.html

YouTube Link : <https://www.youtube.com/watch?v=kkJn8zxYC8Q>