# About Ai-Thinker Rd-Kit can work with 6 radar modules, what's it exactly??

Rd-Kit is a radar Bluetooth baseboard developed by Ai-Thinker Co., Ltd. The Bluetooth backplane core processor chip PHY6252 (SSOP24) is a highly integrated low-power Bluetooth system-on-chip (SoC).

We developed it adapted the hardware to **Rd-02B and Rd-02C.**, **Rd-03, Rd-03D**, **Rd-03E and Rd-04 module**, a total of 6 radar modules, specially designed for radar debugging scenarios.

The software is currently adapted to 4 radar modules: Rd-03, Rd-03D, Rd-03E and Rd-04. Among them, Rd-03 has 70cm resolution firmware and 24cm resolution firmware, and Rd-03E has precision ranging firmware and gesture recognition firmware.







# 1. Hardware prepare

Hardware	Quantity
Rd-Kit	1
Rd-03	1
Rd-03D	1
Rd-03E	1
Rd-04	1

2. Software prepare

### Ai Net assistant APP: <u>Android APP</u>

Ai Net assistant APP: IOS APP wait for update



# 3. Rd-Kit status indicator lights and buttons

No.	Description
(1)	BT-DOWN button, Bluetooth chip download button
2	RD-RST button, Radar power-off reset button
3	BLE indicator blue light, indicating Bluetooth connection status (flashes slowly when not connected, turns off after connected)
4	Radar LED is a blue light that indicates the connection status between the radar module and the development board (it flashes slowly when not connected, and turns off when connected)
(5)	Activate LED indicator blue light (lights up when the radar triggers a human presence, and turns off when no one is around)
(6)	Reserved User1 blue light

## 4. Use Rd-Kit configuring with Rd-03

1. Connect Rd-03 to Rd-Kit. Before connecting to the radar, the Radar LED flashes slowly. After the connection is successful, the Radar LED turns off.



2. Open the Ai Net assistant APP, click on the radar device, and click refresh if the corresponding device does not pop up. After the device appear name as radar model + the last 4 digits of the MAC address, you can click to access the corresponding configuration page. The BLE LED turns off after the connection is successful.

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Radar equipment searching Cancel search 2. Cick for search The default connection password is	earching
aithinker Rd-Kit_1122	RSSI: -70
1.1.0	00 1020
1.1.0 3. Radar module	K33I30
1. Click Radar	device
N)) NFC device Radar	3 device

3. After the connection is successful, you will enter the following interface. The upper half area displays the current radar data, such as trigger status, target distance, farthest distance gate and unmanned duration. In the middle is the setting button. Click to read to refresh the upper half area. Radar configuration parameters, click Restart Module to restart the radar module.

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	Rd-03	3_FFFF				
	Targe	t distance	9		0.12m	
Fa	3 arthest ranç	ge gate		Unmanne	1 d duration(\$	5)
		Set	paramet	ers		
	Read			Resta	rt module	
75						
100 75 50				_		
100 75 50 25 0 0	inergy value	6 Trigger three	shold Ma	0.70 9 ntain threshol	0m/Range g	ate
100 75 50 25 0 0 0 E Distar	anergy value	6 Trigger three	shold <mark>–</mark> Ma	0.70 9 ntain threshol	)m/Range g <sup>12</sup> d	ate 15
100 75 50 25 0 0 0 E Distar	anergy value	6 Trigger three	shold Ma	0.70 9 ntain threshol	0m/Range g	ate 15
100 75 50 25 0 0 0 10 11 8	Energy value	6 Trigger three	shold Ma	0.70 9 ntain threshol	0m/Range g 12 d	ate 15
100 75 50 25 0 0 0 E Distar	3 inergy value ince (m)	6 Trigger three	shold <b>—</b> Ma	0.70 9 ntain threshol	)m/Range g d	ate 15
100 75 50 25 0 0 0 10 50 25 0 0 0 8 6 3 0 0 0 8 6 3 0 0 0 9 10 10 10 10 10 10 10 10 10 10 10 10 10	anergy value	6 Trigger three T0-40	shold Mar T0-30	0.70 9 ntain threshol	)m/Range g d <sup>12</sup> <u>Time</u> To-10	ate 15 (s).

4. Click Parameters Settings to enter the radar configuration parameter interface. The settable data include unmanned duration, as well as the trigger threshold and holding threshold of each distance gate. Set the farthest distance gate by sliding the progress bar.

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← Para	meter set	tings	
Firmware vers	ion		1.1.0 >
Range Gate Re	solution		0.70
Unmanned du	ration(S)		1 >
Farthest range	gate		3
Range gate	Trigger threshold	Maintain threshold	Operation
Range gate 0	47.78	46.02	Set up
Range gate 1	44.77	43.01	Set up
Range gate 2	34.77	26.02	Set up
Range gate 3	33.01	24.77	Set up
Range gate 4	26.98	24.77	Set up
Range gate 5	26.02	23.01	Set up
Range gate 6	26.02	23.01	Set up
Range gate 7	24.77	21.76	Set up
Range gate 8	24.77	21.76	Set up
Range gate 9	24.77	20	Set up
Range gate 10	24.77	20	Set up
Range gate 11	23.97	20	Set up
Range gate 12	23.97	20	Set up
Range gate 13	23.01	20	Set up
Range gate 14	23.01	20	Set up

5. For specific setting parameters, please refer to the Rd-03 module manual: Click to download

#### 5. Use Rd-Kit configuring with Rd-03D

1. Connect Rd-03D to Rd-Kit. Before connecting to the radar, the Radar LED flashes slowly. After the connection is successful, the Radar LED turns off.



2. Open the Ai Net assistant APP, click on the radar device, and click refresh if the corresponding device does not pop up. After the device appear name as radar model + the last 4 digits of the MAC address, you can click to access the corresponding configuration page. The BLE LED turns off after the connection is successful.



3. After the connection is successful, enter the following interface. You can switch the target detection mode of the radar, which is divided into single target detection and multi-target detection. Click Restart Module to restart the radar module. The lower half is the target location and target information.

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Rd-03D_F	FFF
arget detection r	node
<ul> <li>Single target detection</li> </ul>	O Multiple target detection
	Restart module
irget location	
arget information	
arget information	
arget information Target 1 arget distance	0.33 m
arget information Target 1 arget distance arget angle	0.33 m 0.00 °

4. For specific setting parameters, please refer to the Rd-03D multi-target trajectory tracking user manual: <u>Rd-03D multi-target trajectory tracking user manual</u>

## 6. Use Rd-Kit configuring with Rd-03E

### Accurate ranging firmware

1. Connect Rd-o3E to Rd-Kit. Before connecting to the radar, the Radar LED flashes slowly. After the connection is successful, the Radar LED turns off.



2.Open the Ai Net assistant APP, click on the radar device, and click refresh if the corresponding device does not pop up. After the device appear name as radar model + the last 4 digits of the MAC address, you can click to access the corresponding configuration page. The BLE LED turns off after the connection is successful.

Ai Net Assistant       Image: Cancel search         Radar equipment searching       Cancel search         Cancel search       2. Click for searching.         The default connection password is       Batch upgrade         Image: Cancel search       1.10         Rd-Kit_1122       RSSI: -76         1.10       RSSI: -76         Refore       R.10         Refore       RSSI: -76         1.10       RSSI: -76         Refore       RSSI	09:45 🚊 🛞 🕅	▼∠! ≘ 77%
Radar equipment searching         • Cancel search         2. Click for searching         The default connection password is atthinker         Batch upgrade         Image: Rd-Wit_1122 transform         1.1.0         Rd-03E-Ranging_FFFF         RSSI: -45         3. Radar module(Ranging)         A. Click Radar device	Ai Net Assistant	鐐
Rd-Kit_1122       RSSI: -76         1.1.0       RC-03E-Ranging_FFFF         Rd-03E-Ranging_FFFF       RSSI: -45         3. Radar module(Ranging)         A. Radar module(Ranging)         I. Click Radar device	Radar equipment s Cancel search The default connection passwor aithinker	earching 2. Click for searching ord is Batch upgrade
Rd-03E-Ranging_FFFF RSSI: -45 3. Radar module(Ranging) 1. Click Radar device	Rd-Kit_1122	RSSI: -76
3. Radar module(Ranging) 1. Click Radar device	Rd-03E-Ranging	_FFFF RSSI: -45
	3. Radar mo	dule(Ranging)
NEC devices Bedes devices	N))	

3. After the connection is successful, the following interface will be entered. The upper half of the area displays the current radar data, such as target trigger status, target distance, micro-motion detection range, motion detection range and unmanned duration. When the pause button is turned on, it will stop receiving radar data. , in the middle is the setting button. Click to read to refresh the radar configuration parameters in the upper half of the area. Click to restart the module to restart the radar module.

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← Rd-03E-Ranging_FFFF					
Mi	oving target cro moving target	36 CM			
Pause When the pause is o data	n, it will stop receiving	g radar			
30~425 Micro movement range (Unit: cm)	30~717 Movement range (Unit: cm)	20 Unattended waiting time (Unit: 50ms)			
Read Factory res	et Re	et parameters			
Distance (cm)					
600					
400					
200					
0 T0-15 Detection range	T0-10 T(	<b>Time (s)</b> 0-5 TO			

4. Click Parameters settings to enter the radar configuration parameter interface. It is recommended that the parameters that can be modified are the top micro-motion range, motion range and unattended waiting time.

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← Parameter settings	
Firmware version	1.1.0 >
Micro movement range (Unit: cm)	30~425 >
Movement range (Unit: cm)	30~717 >
Unattended waiting time (Unit: 50ms)	20 >
Clutter suppression factor	
Movement	2 >
Micro movement	8 >
Sliding window size	
Movement	5 >
Micro movement	10 >
Noise floor coefficient	
Proximal movement	40 >
Distal movement	6 >
Proximal micromotion	40 >

5. For specific setting parameters, please refer to the Rd-03E Precision Ranging User Manual: <u>Rd-03E Precision Ranging User Manual</u>

### Gesture recognition firmware

**1.** Connect Rd-03E to Rd-Kit. Before connecting to the radar, the Radar LED flashes slowly. After the connection is successful, the Radar LED turns off.



2. Open the Ai Net assistant APP, click on the radar device, and click refresh if the corresponding device does not pop up. After the device appear name as radar model + the last 4 digits of the MAC address, you can click to access the corresponding configuration page. The BLE LED turns off after the connection is successful.

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Ai Net Assistant	
Radar equipment searchin Cancel search 2. Click	g c for searching
aithinker Rd-Kit_1122 1.1.0	RSSI: -79
Rd-03E-Gesture_FFFF	RSSI: -35
ESL-0606 0.0.0	RSSI: -82
1. Click R	adar device
N)) NFC device	adar device

3. After the connection is successful, the following interface will be entered. The upper half of the area displays the lighting area of the radar. Different lights will light up in different ranges of target distances. The lighting area can be set.

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← Rd-0	3E-Gest	ure_	FFFF		
54	см				9
Lighted area (cm)	60	<	120	<	200
Reporting cycle (i	ms)				50
Distance (cm)					
200					
150					
50				M	MM
0 T0-15	T0-10		T0-5		Time (s) T0

4. For specific setting parameters, please refer to Rd-03E Gesture Recognition User Manual: <u>Rd-03E Gesture Recognition User Manual</u>

## 7. Use Rd-Kit configuring with Rd-04

1. Before using Rd-Kit to configure Rd-04, you need to remove the onboard MCU of Rd-04, and then manually add the I2C\_EN pin header.



2. Connect Rd-04 to Rd-Kit. Before connecting to the radar, the Radar LED flashes slowly. After the connection is successful, the Radar LED turns off.



3. Open the Ai Net assistant APP, click on the radar device, and click refresh if the corresponding device does not pop up. After the device appear name as radar model + the last 4 digits of the MAC address, you can click to access the corresponding configuration page. The BLE LED turns off after the connection is successful.

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Ai Net Assistant	鐐
Radar equipment search Cancel search 2. Clic The default connection password is aithinker	ching ck for searching <sup>3</sup> Batch upgrade
Rd-Kit_1122	RSSI: -81
Rd-04_FFFF 1.1.0 3. Rada	RSSI: -51
ESL-0606 0.0.0	RSSI: -83
1. Cli	ck Radar device
NJ) NFC device	& Radar device

4. After the connection is successful, the following interface will be entered. The upper area displays the status of the target. Modifiable configurations include induction threshold, induction delay, and block time.

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1	>

5. For specific setting parameters, please refer to the Rd-04 module manual: <u>Rd-04 module</u> <u>manual</u>

# 8. Contact us

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