



# Falling Detection Radar (Tuya Smart) Specification ST-FDA1W

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## 1. Overview

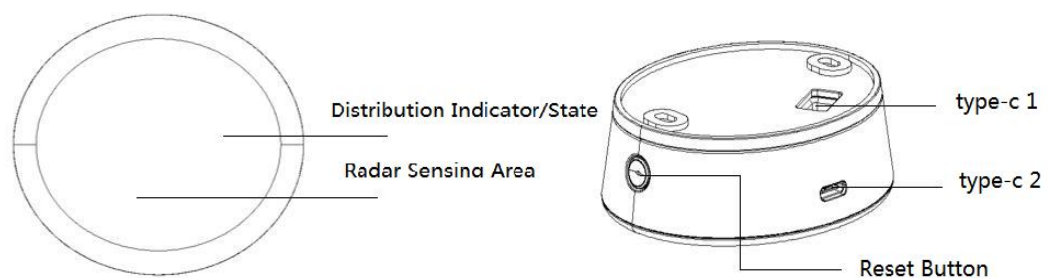
Human fall detection radar is based on millimeter wave Doppler frequency modulated continuous wave radar system to realize the static perception of human biological movement and human biological perception, realize the wireless perception of personnel status in specific places through the synchronous perception technology of Doppler parameters of personnel movement and personnel physiological parameters, and realize the scene linkage through the wireless signal notification gateway; Suitable for home, hotel, office and other places. (not affected by temperature, humidity, noise, airflow, dust, light and other factors)

## 2. Radar Performance Parameters

Part Number	ST-FDA1W
Communication	WiFi (2.4G)
Outline Dimension	29.5×73×86mm
Power Input	5V==1A
Radar Frequency	24.05~24.25GHz
Measuring Principle	Doppler
Transmitting Power	6dBm
Horizontal Detecting Angle	90°
Vertical Detecting Angle	60°
Sitting Detecting Range	Max 4m
Movement Detecting Range	Max 12m
Operating Temperature	-10℃-50℃
Operating Humidity	20%-85% (non-condensing)
Installation	Top-mounted

## 3. Instruction of Radar

### 3.1 . External Appearance



## 3.2 . Network Distribution

### 3.2.1 APP Downloading and Registration

Search "TuyaSmart" in APP store, install, register with phone number and log in.



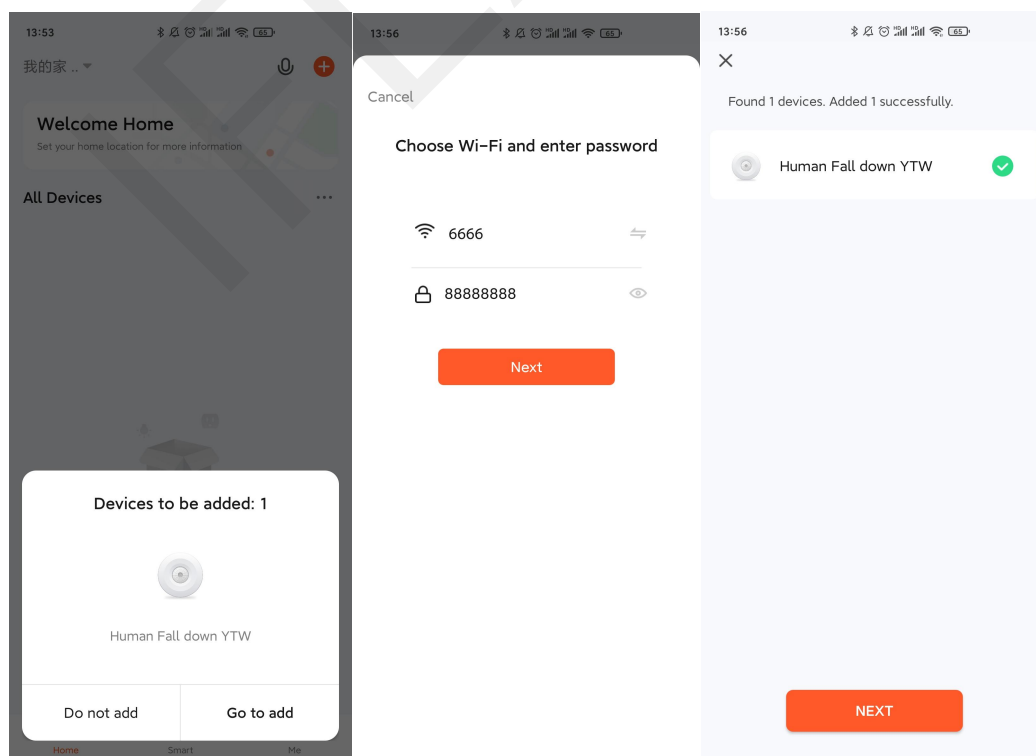
### 3.2.2 Distribution Steps

(1) Make sure your mobile connect to 2.4GWiFi (Currently does not support 5GWiFi ) and turn on the Blue Tooth.

(2) If the red spot keeps flashing, then the device is distributing network; if not, please long-press 5s of the reset button until the indicator is off and then flashes, entering distribution mode.

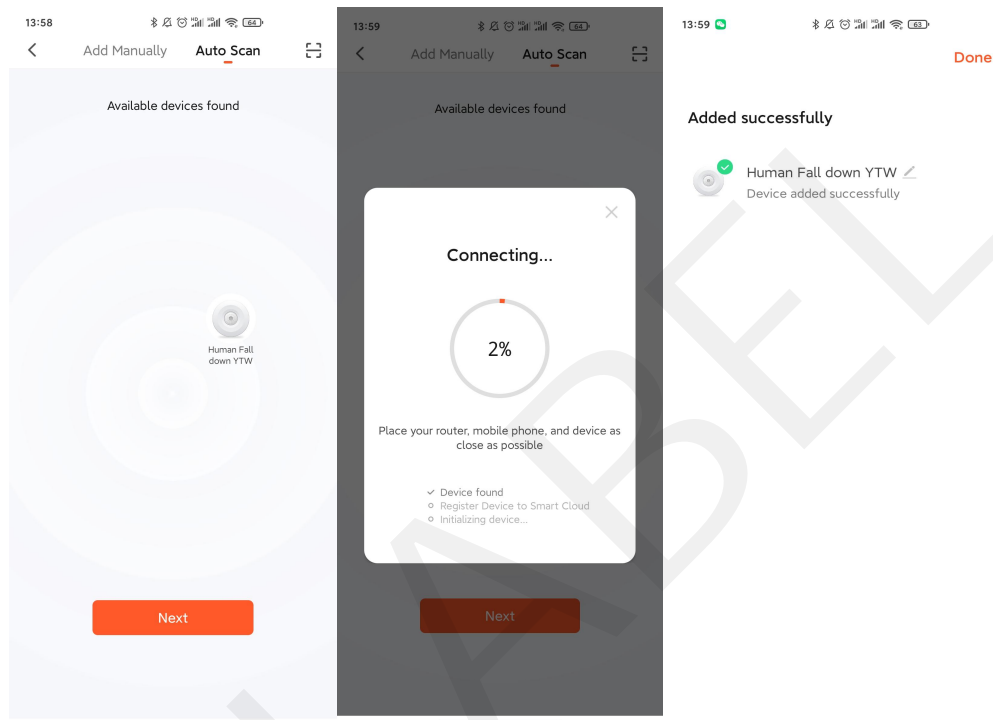
#### APP distribution option 1 (Blue Tooth) :

- (1) Click "to add" of the Blue Tooth device scanned;
- (2) Select WiFi (2.4G) for connection and enter password. Click connect and wait for completion;
- (3) WiFi connection done, page turned to device name. Please enter the device name and click "start to use" to finish adding new device.



### Option 2:

- (3) Click "+" on the right top , add new device and choose to automatically;
- (4) Click "next" after a new device is found;
- (5) Choose WiFi (2.4G) for connection and enter password. Click connect and wait for completion;
- (6) Wait until APP finishes network distribution to connect Tuya Wifi Radar device.



## 3.3 . Installation

### 3.3.1 Instruction

(1) Radar scanning will penetrate objects with low density such as glass, veneer and gypsum board partition wall, but cannot penetrate conductive media such as human body, liquid and metal objects. Please confirm the installation position according to the room layout before installation;

(2) The installation method is top mounted. It is recommended that the installation height be within 3 M. The installation scene is recommended to be in slippery areas such as kitchen and toilet;

(3) Power supply via USB interface

(4) Use the upper wall mounting bracket to drill the wall and push in the capsule;

(5) Push in the expansion screw to secure the mounting bracket;

(6) Align the radar base with the snap of the mounting bracket and fix the radar in the direction of rotation;

(7) Power-on the device;



### 3.3.2 Precautions

(1) Live operation is prohibited during product installation. Please install it by professional personnel;

(2) Power supply via USB interface;

(3) Do not use beyond the load;

(4) When the radar is powered on, it needs to be preheated for 60s before it starts to work;

(5) This product is only suitable for installation in indoor environment. It is prohibited to install in areas that can be covered by rain or wet;

(6) Objects shall not be blocked on the radar detection surface, and there shall be no moving metal objects and large potted plants within the radar detection range;

(7) During installation, ensure that the radar installation position is stable without shaking;

(8) The installation position shall be at least 1m away from the air conditioning port and fresh air outlet;

(9) The installation interval between radars shall be at least 1m to avoid co-frequency interference.

## 4. Radar Function Distribution

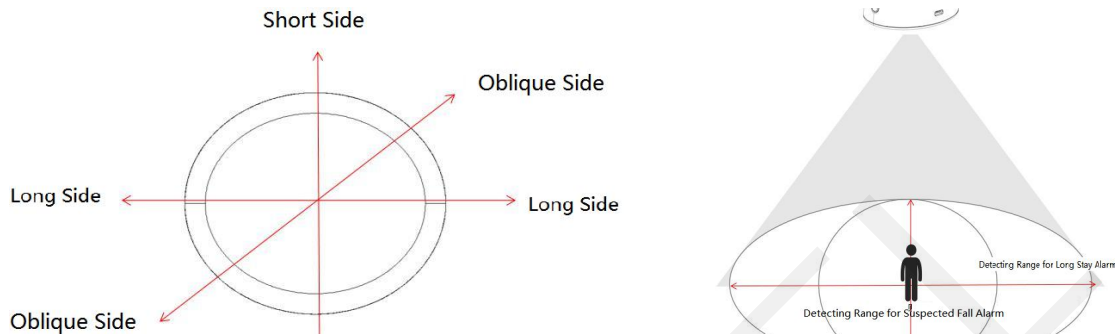
### 4.1 . Sensing Range

Millimeter wave radar can sense the existence of human body through large action or micro action during human sitting. When the radar detects the existence of human body, it will trigger **somebody** command to report, and the indicator light is always on; When the human body is not sensed, the **nobody** command will be triggered and the indicator light will go out.



When a rapid fall occurs within the detection range, the radar will report a suspected fall alarm; If the human body remains stationary in the detection area for a long time, the radar will give a classified alarm according to the residence time.

### Diagram of Fall Detection Range:



The detection range of static dwell alarm of roof-mounted radar is 3M \* 4m, and the detection range of suspected fall is 3M \* 3M. The radar installation position needs to be designed according to the room layout.

## 4.2 . Scenario Setting (Sensing Range Setting)

	Trigger Range (Diagram)	Stationary Trigger Range (Diagram)
Default	Wide-angle 13m/Narrow-angle 9m/Oblique angle 10m	Wide-angle 6m/Narrow-angle 3m/Oblique angle 4m
Office	Wide-angle 12m/Narrow-angle 7m/Oblique angle 8m	Wide-angle 6m/Narrow-angle 3m/Oblique angle 4m
Hotel	Wide-angle 12m/Narrow-angle 6m/Oblique angle 7m	Wide-angle 6m/Narrow-angle 3m/Oblique angle 4m
Living Room	Wide-angle 10m/Narrow-angle 3.5m/Oblique angle 4.5m	Wide-angle 6m/Narrow-angle 3m/Oblique angle 4m
Bedroom	Wide-angle 7.5m/Narrow-angle 2m/Oblique angle 3.	Wide-angle 6m/Narrow-angle 3m/Oblique angle 4m
Regional	5mWide-angle 5m/Narrow-angle	Wide-angle 6m/Narrow-angle 3m/Oblique angle 4m
Bathroom	1m/Oblique angle 2m Wide-angle 2.5m/Narrow-angle 1m/Oblique angle 2m	Wide-angle 6m/Narrow-angle 3m/Oblique angle 4m

## 4.3 . Perceptual Judgment

### 4.3. 1 Fall Alarm States: Suspected Fall Alarm/Long-stay Alarm:

Fall Detection Switch: When switched off, it will suspend data report of suspected fall alarm/ long stay alarm.

Suspected Fall Alarm: Within the detecting range, radar will make report if a quick fall act happens.

Cancellation of Fall Alarm: Within the detecting range, radar will cancel the alarm if the personnel rise up after fall.

Long Stay Alarm: With the detecting range, radar will make alarms in grades if the personnel stays too long, e.g. if failed personnel stays in coma, duration meets 5min/10min/30min/60min, radar will make alarm reports accordingly.

### 4.3.2 Sensing State: Somebody/Nobody state Judgment:

If the personnel enters the detecting range, radar will display somebody state in real - time.

If there is nobody within the detecting range, radar will keep monitoring if no real human body act or respiration exists and output nobody when confirms.

### 4.3.3 Human Body Act Judgment: Active/Stationary/Nobody Judgment:

Active: Radar will output Active state if there is personnel within the detecting coverage with acts like walking and etc.

Stationary: Radar will output Stationary state if the personnel remains stationary or just left the coverage when the radar still in Stationary mode.

Nobody: Radar will output Nobody state if within the coverage there is no personnel for a certain time.

### 4.3.4 Human Body Moving State: Approaching/Leaving/None State Judgment:

Approaching: Radar will output Approaching state if the personnel becomes close to radar sensor.

Leaving: Radar will output Leaving state if the personnel becomes away from radar sensor.

None State: Radar will output None state if within the coverage, the personnel is stationary or makes disordered-movements.

### 4.3.5 Body Motion Amplitude:

To define the extent of human body acts or the distance away from radar sensor, ranging from (0~ 100)



Parameter Value	Environment State	Description
0	Nobody	No personnel present within the detecting coverage
1	Stationary	Only with respiration and no body/limb movements
2-30	Slight Body Motion	Only with slight head or limb motions
31-60	Walk/Quick Body Movement	Relatively slow body movement
61-100	Run/Big Movement within Close Distance	Quick body movement

#### 4.4 . Indicators

The radar contains an RGB light for radar distribution network and working status indication.

Indicator States	Description
Red Slow Flash	Device Off-line
Red Quick Flash	Device Network Distribution
Green Long Stay	Radar Capturing Human Body
Green Off	Radar Capturing No Signal of Personnel

#### 4.5 . Press Button

The radar contains a physical key, which is used to reset the distribution network of the equipment. The specific operations are as follows:

Press and hold the key for 5S, release the key when the equipment indicator is off, and the indicator flashes quickly, indicating that the radar enters the distribution network mode;

## 4.6 . Sensitivity Gear Setting

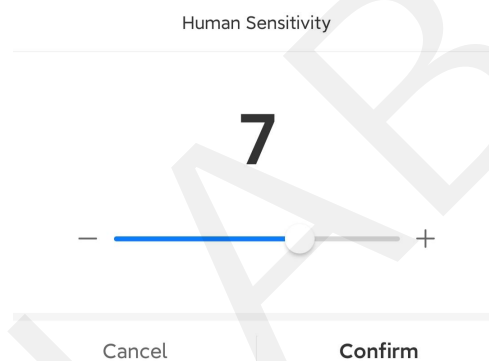
Millimeter wave radar uses electromagnetic wave to transmit and receive and detect targets, which will be interfered by moving objects in the surrounding environment. The radar sensitivity can be adjusted according to the actual application scene to adapt to the corresponding environment. The sensitivity gear ranges 1 - 10;

**High (7-10)** : It is suitable for scenes with few environmental interference and high detection sensitivity, and can detect subtle action changes, such as confined space, warehouse, insurance bank, etc; (note that the sensitivity of this mode is too high, which is easy to be disturbed by the environment and misjudge someone)

**Medium (4-6)** : Suitable for ordinary indoor scenes, such as family, office, hotel, etc; (default)

**Low (1-3)** : It can only be triggered by a large range of movement, and is not easy to be disturbed by the shaking of curtains and plants. This scene is suitable for corridors, parking lots and other scenes.

Default Gear to be 7 ;



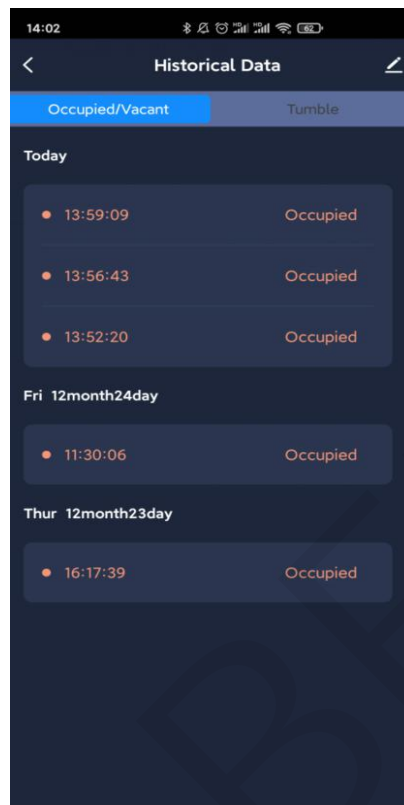
## 4.7. Fall Alarm Report Time Setting

The adjustment gear of fall alarm judgment time is 1 - 10min, which can be adjusted according to different needs of users. The default is 3min. If the judgment conditions of the real fall alarm are met within 3min after the suspected fall is triggered, the real fall alarm will be reported after 3min.

Setting Options: None (90s) ,10s , 30s ,1min ,2min ,5min ,10min ,30min ,1H;

## 4.8 . History Record

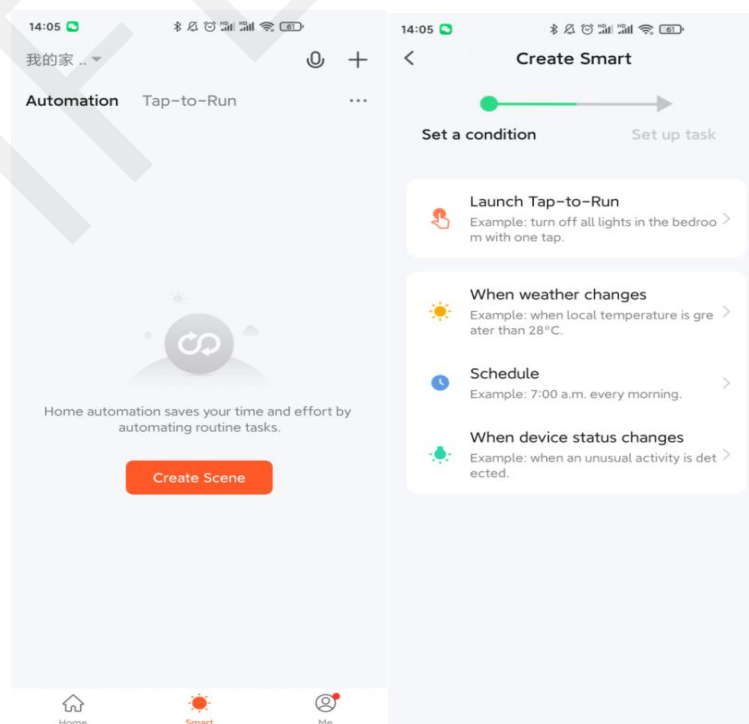
Log of radar detection



## 4.9 Device Linkage

Create smart scenario via Tuya Smart APP "Intelligent"

Method: Click "Intelligent"- "to add"- "trigger" to realize it(can also realize linkage between Tuya Eco-system Hardware products )



## 5. FAQs

### 5.1 . False Report of Somebody In Nobody Circumstance

Note: In view of the complexity of electromagnetic wave propagation and processing, there will be false alarm in the actual use of our radar, and there will be some factors affecting the radar in the radar use environment, including:

5. 1. 1 Physical disturbance: including the vibration of air conditioners, fans, motors and other facilities, and the passing of cats, dogs, mice, birds and other animals, which may cause radar misjudgment of the environment;

5. 1.2 Space electromagnetic wave disturbance, including possible high-power electrical equipment around the radar, places with dense electromagnetic waves, the coexistence of multiple radars and other environmental factors, may also cause radar misjudgment. This interference item is rare in home and office scenes, but it will be more in industrial environments such as factories;

5. 1.3 Power disturbance mainly refers to the power radar crosstalk caused by related facilities and equipment in the municipal power environment, resulting in unstable radar power supply and misjudgment of output.

### 5.2 . False Report of Nobody In Somebody Circumstance

5.2.1 The existing human body is beyond radar detecting range;

5.2.2 The human body is blocked by metal objects or too-thick desk/ chairs;

5.2.3 There may be cases in which radar reports nobody state because personnel opting for a lateral sleep position that cannot detect respiration

### 5.3 . Instruction of Indicator&Device Failure Types

Device Failure Types	<ol style="list-style-type: none"> <li>1. Surface crack caused by structural or material factors</li> <li>2 . Indicator failure</li> <li>3 . Reset button failure</li> <li>4 . WiFi connection failed</li> <li>5 . Human body sensing failure</li> </ol> <p><b>Note:</b> We can exchange the like products if there comes the nonartificial faults or problems above.</p>
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