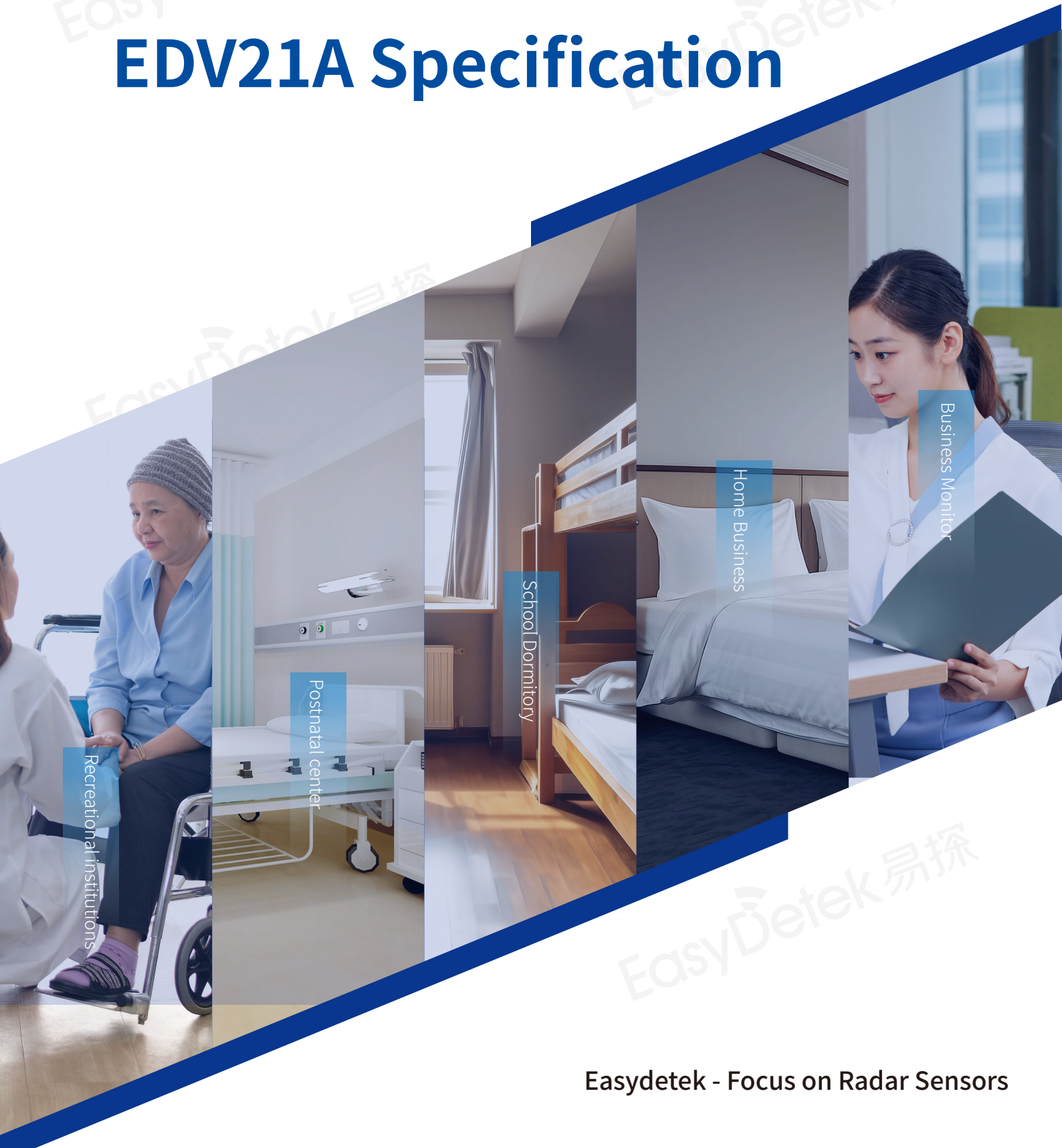
深圳市易探科技有限公司
Shenzhen EasyDetek Technology Co.,Ltd

EasyDetek易探

Sensors for monitoring signs in situ

EDV21A Specification



Easydetek - Focus on Radar Sensors

EDV21A

Product Features

- **Adopting cutting-edge 60G millimeter wave sensing technology, real-time detection of millimeter-scale micro-motion in the chest cavity, providing comfortable and senseless non-contact long-term stable monitoring;**
- **Combined with edge computing and intelligent algorithms, continuously monitor and analyze target presence, and key indicators such as heart rate, respiration and body movement;**
- **Intelligent monitoring of light sleep, deep sleep, REM sleep, wakefulness and snoring in sleep stages, which can assess and review sleep quality;**
- **Intelligent recognition of abnormal breathing or heart rate, prolonged time away from the position and other events, support timely alerts, guarding the user's health and safety;**
- **No camera privacy risk, completely and strictly comply with privacy regulations in the physical and data layers to protect user information security;**
- **Able to operate stably in different environments, unaffected by light, temperature, humidity and other factors.**

Electrical Parameters

Working voltage of the whole machine	12V DC
Operating current of the whole machine	0.15mA running average 0.25mA running maximum
Standby power consumption	average less than 1.8W, maximum values≤3W @12 DC
communication method ①	WEBSOCKET、UART

Functional Parameters

Detection distance ②	0.05m-0.6m
On/off detection time	tyVpically 1-2 seconds in position, 5-45 seconds out of position
Measurement range ③	respiratory range 0-30 breaths, heart rate range 0-105
Resolution ④	millimeter Human Motion Detection
Update time	interval not exceeding 10 seconds, 1 to 10 seconds, currently set to 1 second

Launch Parameter

Radar emission frequency	60-64GHz
Radar transmitting power	⩽15dBm（max）
WIFI transmitting frequency	IEEE 802.11b/g/n (2.4 GHz Wi-Fi)
WIFI transmitter power	maximum values⩽20dBm

Operating Parameter

Operating temperature	-20~60°C
Storage temperature	-20~85°C
Data acquisition frequency	20-100 times per second
Radar beam angle	120° (XZ plane) 120° (YZ plane)

Remarks:
① Customizable output UDP, MQTT, HTTP interfaces.
② The detection distance can cover the scene of beds, sofas, ergonomic chairs, rocking chairs, massage chairs, etc. within a width of 1.2 meters (inclusive).
③ For resting conditions, the error in sleep duration was ±6%, the error in somatic actigraphy was ±5%, the error in heart rate within the measurement range was generally within ±12, the error in snoring detection was ±8%, and the error in breath-holding was about 10%.
④ When the human body is first in position, because of the presence of body movement, the heart rate initialization needs to be sampled for 30 seconds to 1 minute in order for the data to stabilize.When a person is talking, or has mood swings, it can cause large chest ups and downs that may affect the stable detection of signs. Before holding the breath, please lean against a sofa or bed and remain still for 30 seconds without moving, and do not move your body during the breath holding process, and the breath holding can be detected within 20 seconds.

Functional Specifications

1.Function List:

Real-time reporting of the following conditions and support for statistical analysis

Real-time condition values for signs	Value of statistical analysis of signs	Sleep statistics analysis values
On/off condition	Length of time in office	Sleep efficiency
Body movement (big movement, micro movement) condition	Duration/number of time-outs	Sleep quality score
Respiratory value	Body movement	REM sleep duration
Heart rate	Heart health Index	Duration of light sleep
Wakefulness/sleep condition	Respiratory health index	Duration of deep sleep
Snoring condition	Number of bradypneas/pause	Percentage of deep sleep
breath-holding condition	Number of snoring hours	Number of times awake

Functional Description

Functional interface for in-situ vital signs monitoring

1.Real-time condition values for signs:

On/off condition: When a person enters the detection area, it will show in position, and after a period of time, it will show out of position.

Resting/Body motion condition: After the body has a big movement, the resting condition will change to a big movement, and it will be restored after being quiet.

Silent/snoring condition: The display is normally silent and the condition will change to snoring when snoring is detected.

Exhale/Breath hold condition: Breathing out under normal conditions, the condition will change to holding when the body is detected to be holding its breath or not breathing well.

Awake/Sleep condition: After the sensor detects that a person is sleeping, it will enter eye movement, light sleep, and deep sleep conditions respectively, and switch accordingly.

Respiration and heart rate values: When a person enters the detection area, the respiration and heart rate values are displayed, and after the person has been out of position for some time, the values will show 0.

2.Signs and sleep statistics analysis values

Signs and sleep statistics values are updated every 20 seconds.

Compatibility and Expansion

1.Access Support:

- Currently available by using a local server with access to a LAN (off-cloud state).
- Currently, radar data can be sent and received through the serial port to access the higher-level master control.
- Smart home platform integration: can be customized to support mainstream smart home and cloud platforms, such as Graffiti Cloud, Aliyun, Mijia, Haier Smart Home, Private Cloud, etc.
- Customizable mobile APP/small program or web big screen operation.
- The client is compatible with Win10, Win11.

2.Design Features:

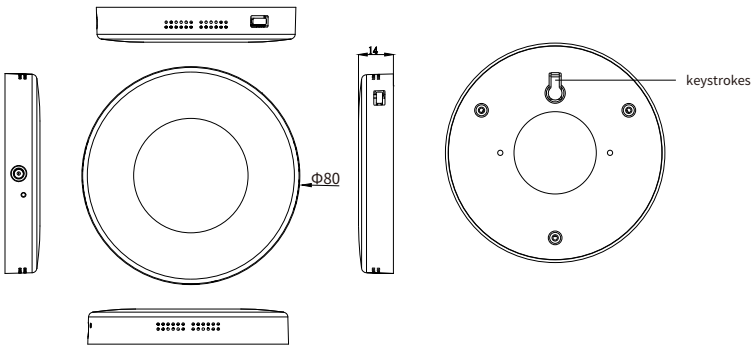
- Compact design: minimalist look, easy to incorporate into a variety of bedroom décor styles.
- Silent operation: no mechanical parts, no noise interference during operation.

3.Installation and use:

- Simple installation: backward installation, behind the sofa and chair or under the mattress selected location installed, power can be used.
- User Interface: Provide web client or serial interface software, customizable mobile APP/applet or web big screen operation.

Product Size

Size unit:mm



The finished product has a DC power interface bit, and the network button, reserved RS232 serial port.When you want to connect to the network, first press it twice quickly and then press it for more than 1 second after releasing it, then release it to enter the network mode.Serial port holder pin counterclockwise order are 5V, Tx, Rx, GND (when using the reserved serial port, please open the block first).

Indication Status

1、 Power-on initialization: radar light blinks once, wifi module is not equipped with network, wifi light blinks slowly for 3 minutes, the equipped device enters the working module;

2、 Configuring the network: wifi light continues to flash fast;

3 、Working mode: radar light blinks every 15s, wifi light blinks fast once per second;

*Fast flash: 200ms on, 800ms off Slow flash: 500ms on, 500ms off

Description of access data

The current product can be used through wireless WIFI network or wired serial port to directly access the self-contained host computer (client), respectively.

If the user needs to access the physical signs and real-time status values to the upper level client or host computer for secondary application via WIFI network or serial port, please refer to the following data definition:

1. Serial port access (baud rate is 115200), the data frame is defined as follows, the length is 36 bytes, of which the frame header is 12 bytes and the parameters are 24 bytes:

Frame header	Lengths	Illustration
Frame header tag	2	0xCCAA
Software version	uint8	major version number
	uint8	minor version number
data frame number	uint32(4)	current frame number
packet length	uint16(2)	packet length
calibration	uint16(2)	checksum, sum of all bytes in the header and body of the frame
Parameters	**Lengths**	**Illustration**
present judgment	uint8	0 out of position 1 in position
respiratory value	uint8	integer value in cycles per minute
heart rate	uint8	integer value in cycles per minute
sports marker	uint8	motion markers 0 resting 1 large motion 2 small motion
abnormal respiratory status (medicine)	uint8	0 normal 1 is slow breathing or asphyxia (apnea syndrome) usually detected in 20-30 seconds
sleep status	uint8	0 Awakening 1 REM sleep 2 Light sleep 3 Deep sleep
snoring status	uint8	0 normal 1 snoring
reserved status	uint8	0 normal reserved
reserved status	uint8	0 normal reserved
distance value	uint8	distance unit
amplitude value	int16(2)	distance unit amplitude
default value	int16(2)	default value
respiratory time-domain value	int16(2)	respiratory time-domain value, LSB =0.0001
time-domain value of the heartbeat	int16(2)	time-domain value of the heartbeat, LSB =0.0001
Reserve 1	uint8	default value，default：0x00
Reserve2	uint8	default value，default：0x00
Reserve3	uint16(2)	default value，default：0x0000
Reserve4	uint16(2)	default value，default：0x0000

Example of a typical data frame：

1.CCAA01024708000024000000010E4B010000000000025B1EFF00E20200000C0169007606

The example in-place state is 01, i.e., occupied, with a respiration value of 0E, i.e., 15, and a heart rate value of 4B, i.e., 75.

2.Wireless WIFI network, HTTP data frame definition：

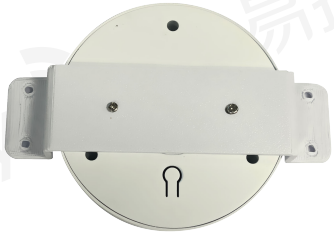
HTTP data frame = serial data frame (36 bytes) + mac address (6 bytes) = 42 bytes = 84 characters

Example of a typical data frame:

CCAA01024708000024000000010E4B010000000000025B1EFF00E20200000C0169007606744DBDFD1EBA

Installation Position

Installation back view, as shown below



bed

Under the mattress or under the bed of the wooden board with brackets fixed installation, the installation position is generally the head of the bed to the bottom 35-40cm, the center line off to the right 5cm, such as Figure 1

sofa

Installed behind the backrest of the sofa and chair, the backrest is generally made of wood or plastic (filled with sponge inside), generally can support, on the wood or plastic with a fixed tray fixed column fixed.Note that it can not be all metal, if it is all metal, it can be installed in front of the metal of the backrest, or add a sponge/plush lumbar support in front of the sofa in the same position, and the device is installed between the lumbar support and the backrest.The position is generally 30-35cm up from the center line of the cushion and 5cm to the right, as in Figure 2.

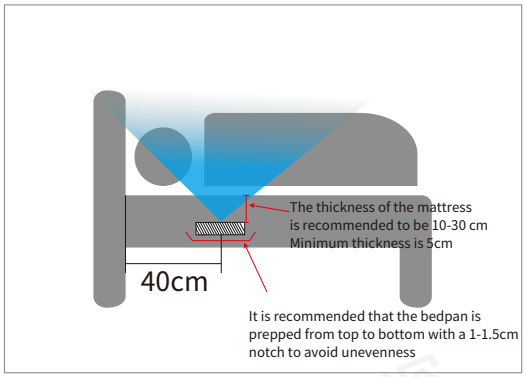


Figure 1

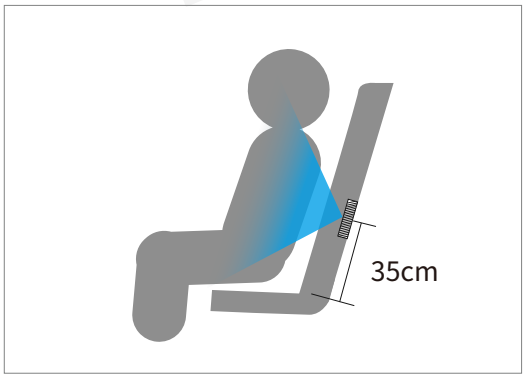


Figure 2

Product Naming Law

ED	Frequency Band	Product Categories	Product Subdivision	Product Number	Delay Time	Serial number
ED	Q	2	0	1A	Y	
EasyDetek	C 5.8GHz	1 Microwave sensor module	0 Ultra-low-power series	0-9, A-Z	Y Has light sensor	
	X 10.5GHz	2. Microwave radar switch	1 Flagship series		N no light sensor	
	Q 24GHz	3 Radar antenna	2 Short-distance series		P programmable	
	V 60GHz	4 MCU	3 Adjustable series			
	W 77GHz	5 Microwave power supply	4 External antenna series			
		6 IC	5 General Series			
		7 Other	6 To be defined			
		8 Networking	7 To be defined			
			8 Basic series			
			9 High altitude series			

Configuration Version Description

【Hardware】:

【Software】:

Historical revision records

Versions	Time	Description	Remarks
V1.0	2025-07-14	First edition	-

Precautions

1. The sensor is powered by the mains. Installation and removal should be performed by professionals. Make sure to cut off the power supply before installation and removal.
2. The sensor should not be installed in a space covered by a large area of metal.
3. When multiple radar sensors are used in the same venue, the installation distance is too close, which may cause individual radar sensors to generate false alarms. The recommended installation distance of the product is greater than 2m.
4. When the sensor is used together with a wireless communication module (NB, Bluetooth, WIFI module), the distance should be increased. It is recommended to keep a distance of more than 1m from high-power wireless communication devices such as routers and wireless hotspots during installation.
5. The sensor light threshold is the test value under sunny environment, no shadow, and diffuse reflection of ambient light.
6. When installing the sensor, it should be as far away from metal, air conditioner outdoor unit, exhaust fan and other vibration scenes as possible to avoid sensor misjudgment.
7. Yitan Technology is committed to providing customers with high-quality and better experience radar sensors. When the product version is updated and iterated, no further notice will be given. If necessary, please contact our sales staff to obtain the latest product information.

For More Information, Please Visit

WeChat Public

WeChat Small Shop