



Product Specifications

Radon Detection Module

Model: TXD100

Version: V1.2

Date: Feb.3rd, 2026

Taiyuan Tengxing sensor technology Co., Ltd

Declaration

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1. Description

The TXD100 is a highly reliable module dedicated to monitoring radon gas concentrations. By detecting alpha particles emitted by radon in the surrounding environment, it achieves high-precision, low-power radon detection characterized by stable performance and rapid response. Data communication is facilitated via a UART interface. Designed for ease of integration, the module can be quickly adapted to a wide range of terminal devices. It operates on a 5V DC power input and features a compact, flexible design; its free-diffusion structural configuration makes it suitable for deployment in most residential and civil environments.



Module Features

Maintenance-free and self-calibrating, UART signal output, Compact size, High data refresh rate, Long lifespan

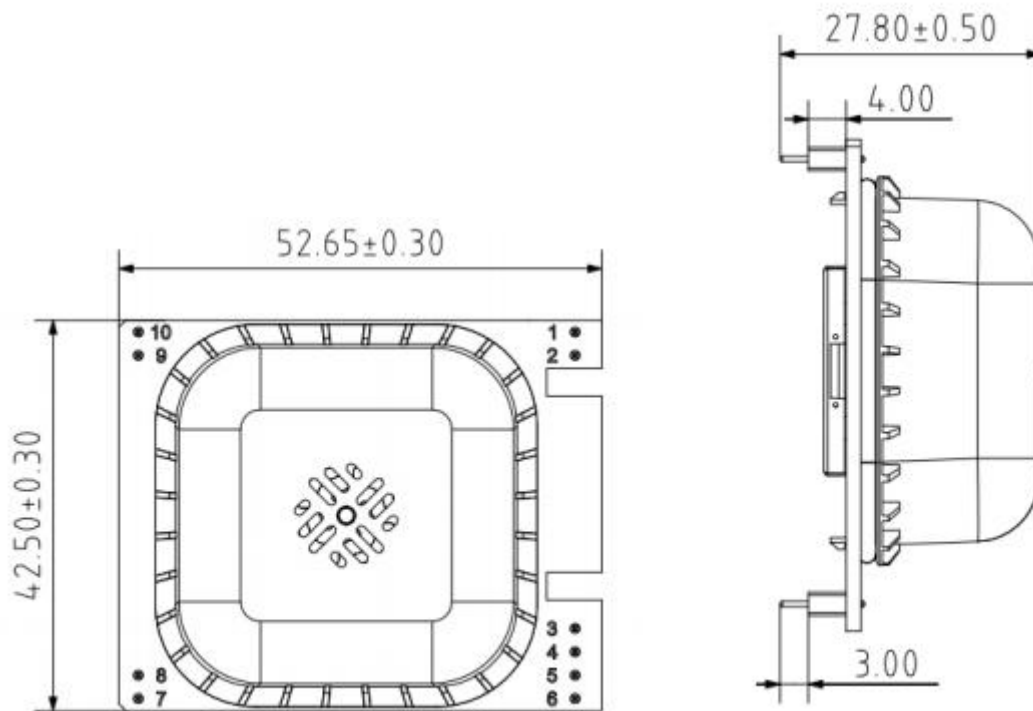
2. Main applications:

Primarily utilized in fixed-position radon gas detectors, it is suitable for the long-term, real-time monitoring of indoor radon levels in homes, schools, offices, and similar environments..

3. Technical specifications

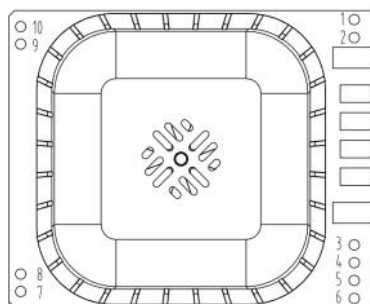
Model	TXD100
Detection gas	Radon
Detection range	0-20000, Unit: Bq/m ³
Output	UART Output (TTL Level, 3.3 V), 9600 bps
Operating Voltage	DC 5.0±0.1V
Operating Current	≤10mA
Preheating Time	3 min
Resolution	1 Bq/m ³
Data Refresh Interval	1 minute (4-hour moving average)
Operating Environment	Temperature: 5°C – 40°C Humidity: 15% RH – 70% RH (non-condensing)
Storage Environment	Temperature: -10°C to 60°C Humidity: 15% RH to 85% RH

Size	52.65mm×42.50mm×27.8m
Weight	About 24.85 g



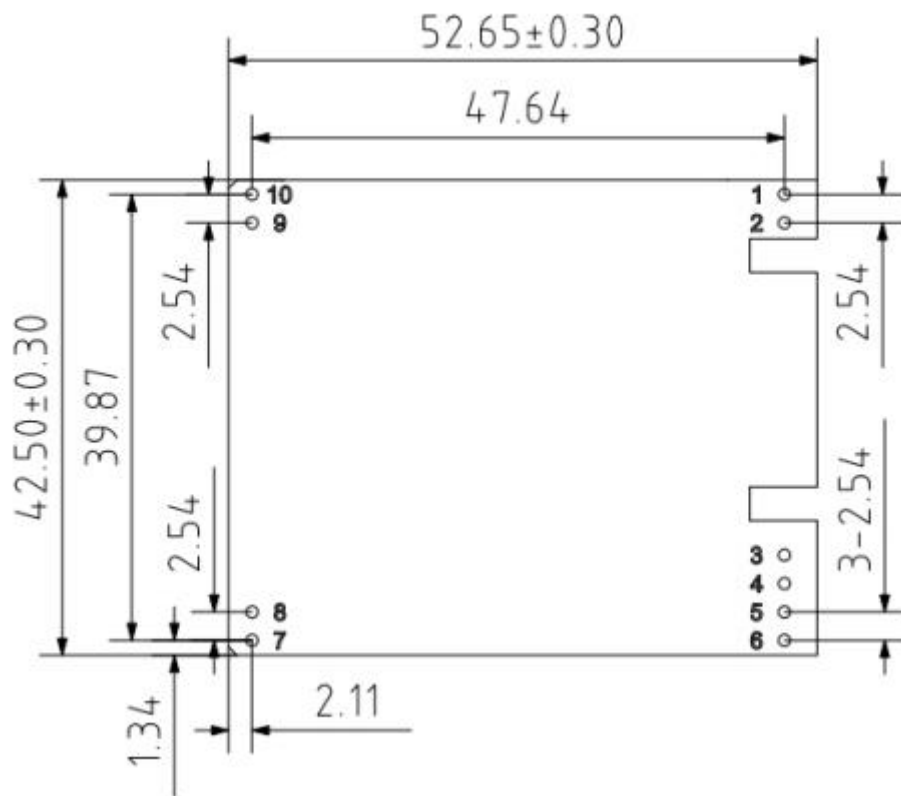
4. Pin Definition

Pin Interface Package: 2.54mm pitch header pins. To prevent deformation, it is recommended to solder all pins during use.



No.	Pin Description	Functional Description	Note
1	GND	Noise Suppression	
2	GND	Noise Suppression	
3	RX	Power Supply Positive	DC 5V(±0.1V)

4	TX	Power Supply Negative	
5	GND	Module Output	3.3V Level
6	VDD	Module Receiver	3.3V Level
7	GND	Noise Suppression	
8	GND	Noise Suppression	
9	GND	Noise Suppression	
10	GND	Noise Suppression	



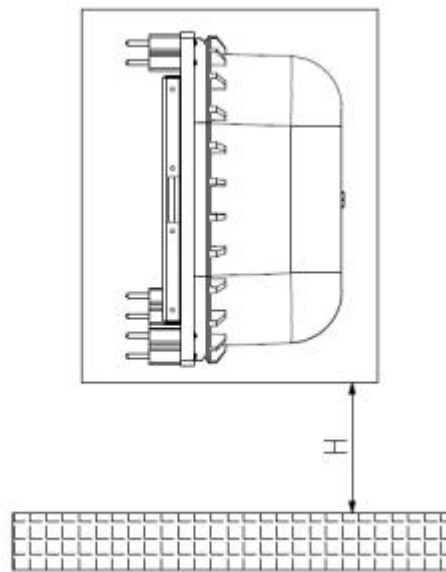
Module PCB Layout Recommended Dimensions

For the dimensions listed above, units are in millimeters (mm) where not explicitly specified; where tolerances are not indicated, the tolerance is ± 0.15 mm.

Installation Method

To ensure measurement accuracy, the module should be positioned upright on a level surface during operation, at a height of at least 50 cm above the ground, and a minimum distance of 100 cm from the nearest door, window, or ventilation outlet.

Ensure that its placement is secure and not prone to being knocked over or displaced. If wall-mounted, the installation height must not exceed 200 cm.



6.Communication Protocol

1.General Settings:

Baud rate	9600
Data bits	8 bits
Stop bits	1 bit
Parity	none

2.Communication Description:

The module supports two communication modes: Query-Response Mode and Active Upload Mode. Upon power-up, the module defaults to Query-Response Mode. If the module does not receive a command frame from the application side within 20 seconds while in Query-Response Mode, it automatically switches to Active Upload Mode. In Active Upload Mode, the module transmits the current concentration value

(expressed in hexadecimal format) once every second. If, while in Active Upload Mode, the module receives a downlink data frame from the application side, it immediately switches back to Query-Response Mode.

3.Communication commands:

Active Upload Mode:

Recei ve	0	1	2	3	4	5	6	7	8
	start bit	Gas Name	Unit	Decimal Places	Gas Concentration Value 1 (High Byte)	Gas Concentration Value 1 (Low Byte)	Gas Concentration Value 2 (High Byte)	Gas Concentration Value 2 (Low Byte)	Check sum
	0*FF	0*3B	0*18	0*00	0*00	0*00	0*00	0*00	0*AD
EXP.	FF 3B 18 00 00 00 00 00 AD								

Gas Name 0x3B represents Radon.

Unit 0x18 represents Bq/m³.

Decimal Places (0x00): Indicates that the uploaded gas concentration value is an integer with zero decimal places.

Note: If the number of decimal places is 0, the resolution is 1;

If the number of decimal places is 1, the resolution is 0.1;

If the number of decimal places is 2, the resolution is 0.01.

Gas Concentration Value 1 = (Gas Concentration Value 1 [High Byte] × 256 + Gas Concentration Value 1 [Low Byte]) × Resolution.

Gas Concentration Value 2 = (Gas Concentration Value 2 [High Byte] × 256 + Gas Concentration Value 2 [Low Byte]) × Resolution.

Gas Concentration Value 1 represents the 4-hour rolling average concentration.

Gas Concentration Value 2 represents the 24-hour rolling average concentration.

Q&A Mode

0x86 Command Frame: Read Gas Concentration Value:

1	0*86	Read Gas Concentration Value							
Send	0	1	2	3	4	5	6	7	8
	start bit	Address	Command	--	--	--	--	--	Check sum

	0*FF	0*01	0*86	0*00	0*00	0*00	0*00	0*00	0*79
EXP.	FF 01 86 00 00 00 00 00 79								
Module Response	0	1	2	3	4	5	6	7	8
	start bit	Command	Gas Concentration Value 1		Gas Concentration Value 2		Reserved	Reserved	Checksum
	0*FF	0*86	High byte	Low byte	High byte	Low byte	0	0	
EXP.	FF 86 00 00 00 00 00 00 7A								

Gas Concentration Value 1 = Gas Concentration Value 1 (High Byte) × 256 + Gas Concentration Value 1 (Low Byte).

Gas Concentration Value 2 = Gas Concentration Value 2 (High Byte) × 256 + Gas Concentration Value 2 (Low Byte).

Gas Concentration Value 1 represents the 4-hour rolling average concentration value.

Gas Concentration Value 2 represents the 24-hour rolling average concentration value.

4. Checksum Calculation:

Function Name: unsigned char FucChecksum(unsigned char *i, unsigned char In)

Function Description: Calculates the sum of the first, second, third, fourth, fifth, sixth, and seventh bytes of the transmit and receive protocols, inverts it, and adds 1.

Function Description: Adds the elements from 1 to the second-to-last element of the array, inverts it, and adds 1 (the number of elements must be greater than 2).

```
* unsigned char FucChecksum(unsigned char *i, unsigned char In)
```

```
unsigned char j, tempq=0;
```

```
i+=1;
```

```
for(j=0; j<(In-2); j++)
```

```
tempq+=*i;
```

```
i++;
```

```
tempq=(~tempq)+1;
```

```
return(tempq);
```

7. **Precautions**

1. **Situations to Strictly Avoid:** Condensation. The formation of water condensation on the surface of the sensitive layer will degrade the module's performance characteristics and prevent it from functioning normally.

2. **Situations to Avoid (Where Possible):** Abrupt changes in humidity. Sudden fluctuations in environmental humidity may interfere with the module's output readings. During such fluctuations, the module's reported concentration values should not be used as a reference. Please use the concentration reading obtained after the environmental humidity has remained stable for at least four hours as the reference value.

3. The module must not be subjected to excessive impact or vibration.

4. Do not use this module in systems where personal safety is at risk.

5. Avoid using the module under conditions of intense direct lighting.

8. **Disclaimer**

Our company assumes no liability for damages resulting from the following circumstances:

1. Force majeure events, including natural disasters and similar occurrences.

2. Failure to operate, install, or use the product in strict accordance with the instructions provided in the user manual.

3. Operation or storage of the product in unsuitable or harsh environmental conditions.

4. Unauthorized modification, alteration, disassembly, reassembly, or repair of the product — whether performed independently or by a third party — resulting in product damage, personal injury, property loss, infringement of third-party intellectual property rights, or other adverse consequences.

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