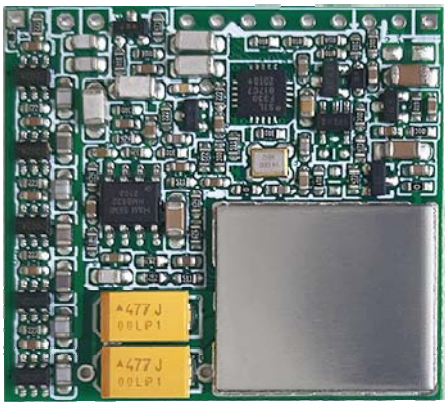
RFID READER MODULE SPECIFICATION AND COMMUNICATION PROTOCOL

JY-LD6900 SERIES



COMPLY WITH ISO 11784/5 INTERNATIONAL STANDARD FOR ANIMAL LABEL IDENTIFICATION

FCC WARNING

FCC Warning StatementChanges or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:+

- - Reorient or relocate the receiving antenna.
- - Increase the separation between the equipment and receiver.
- - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- - Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The device has been evaluated to meet general RF exposure requirement.

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Introduction

KEZLIY(科智立) JY-LD6900 series is a low-frequency (LF) reader module based on radio frequency identification technology. The working frequency supports 134.2±2KHz, conforms to the ISO 11784/5 international standard, and supports electronic tags with FDX-B and EMID protocol formats. Reading, strong compatibility. The radio frequency part of the communication protocol is integrated inside, which can be connected to PC/PLC/SCM. Users only need to receive electronic label data through the UART communication interface, without understanding complex communication protocols..

The reading time of this reader is less than 30ms, the recognition speed is up to 2m/s, and it is equipped with a 62mm diameter circular antenna, and the card reading distance can reach more than 20cm. With 32-level auto-tuning circuit, the auto-tuning function when the power is restored is a major feature of the card reader, which simplifies the initial installation process and ensures that the optimal distance can be automatically adjusted for continuous operation under various conditions ; Under constantly changing environmental conditions, the automatic adjustment function makes the installation easy and the best performance. It has the characteristics of high receiving sensitivity, stable performance, strong reliability, etc., which can meet the requirements of PDA, AGV card reader and other equipment with high requirements for distance, speed, and sensitivity. It is widely used in animal identification, automatic feeding equipment, inventory channels, and intelligence. Weighing, livestock access control, industrial automation, AGV site, production line identification, medical equipment identification and other fields.

Performance index：

- Operating Voltage：5 V
- Power：1.2 W
- Working current：<0.2A
- Working frequency：134.2±2KHz
- Recognition speed：2m/s
- Reading distance：0-180mm
- Support tag type：FDX-B、EMID
- Communication Interface：UART TTL
- Mechanical dimensions：37mm*34.6mm*9.5mm

1. Electrical Parameters

1.1 Limit Parameters

Working temperature…… -20℃~+85℃

Storage temperature..... -40℃~+125℃

Limit voltage (vcc to vss)..... -0.3V~+5.5V

Voltage of power supply pin to ground..... -0.3V~+5.8V

Voltage between signal pin and ground.....-0.3V~+3.5V

Maximum IOL for each pin..... ±2mA

Relative humidity ..... 5%~95%

Note: Operation beyond the "absolute maximum ratings" conditions will cause permanent damage to the device. The above does not involve the functional operation of the device under or beyond these conditions. The device cannot be operated under absolute maximum ratings for a long time, otherwise its reliability will be affected.

1.2 DC Characteristics

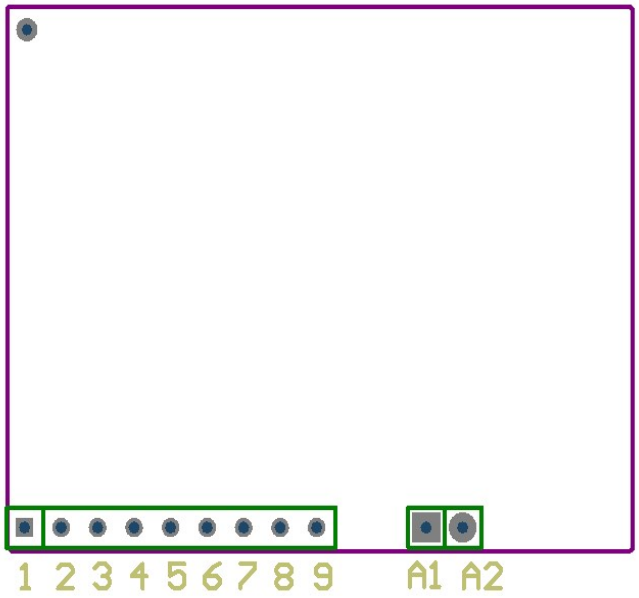
Test Conditions: Temperature=+25℃。

DEVICE DC CHARACTERISTICS TABLE

SYMBOL	PARAMETER	TEST CONDITIONS	MINIMUM	TYPICAL VALUE	MAX	UNIT
VCC	Operating Voltage		3.6	5.0	5.5	V
IDC1	Current Consumption	Normal Mode		200		mA
IDC2	Current Consumption	Standby Mode		0.5		mA
VOL	Output Low Level	$I_{(OLMAX)}$=-2mA	0		VSS+0.3	V
VOH	Output High Level	$I_{(OHMAX)}$=2mA	3.0		3.3	V

2. Pin Description

2.1 Pin Definition Diagram



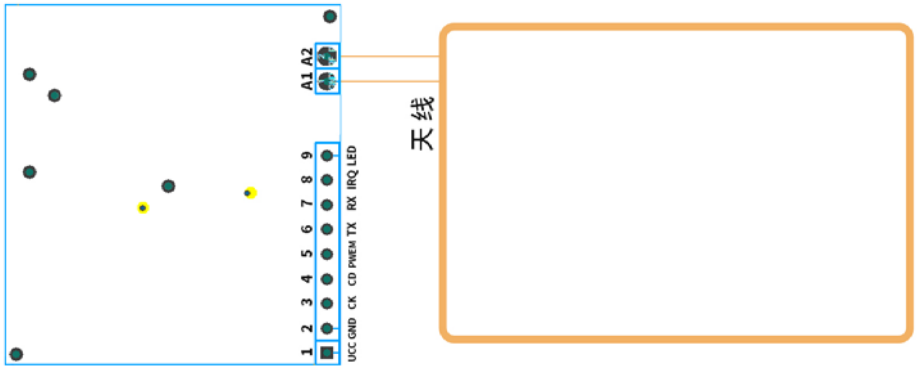
2.2 Pin Description Example Table

PIN	SYMBOL	FEATURES
1	VCC	Power input Pin：5V
2	GND	Power Ground

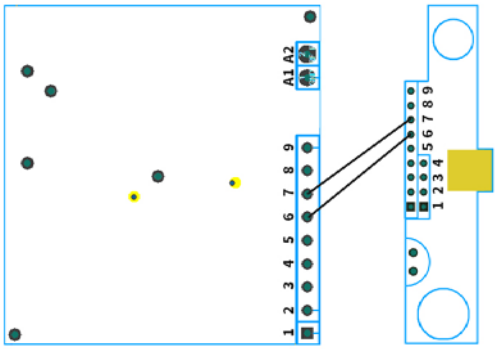
3	CK	Blank
4	CD	Blank
5	PWEN	Module Enable Pin：Active High
6	TX	Data Sending Pin
7	RX	Data Receiving Pin
9	LED1	LED Output Pin： Normal state is high level, when the tag is read, the output low level
A1	ANT	Antenna Pin
A2	ANT	Antenna Pin

2.3 Integration Instruction

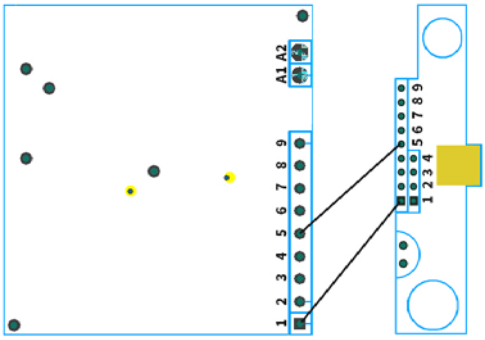
1. According to the example diagram of pin instructions, solder the antenna to pins A1 and A2 of the module.



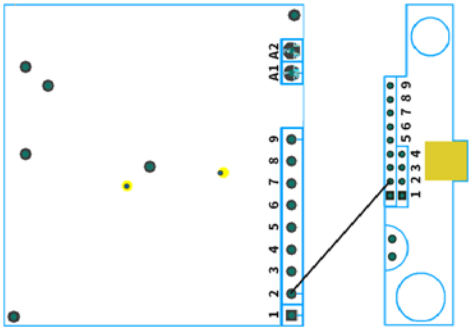
2. Connect pins 6 and 7 of the module to the corresponding TTL communication interface of the host.



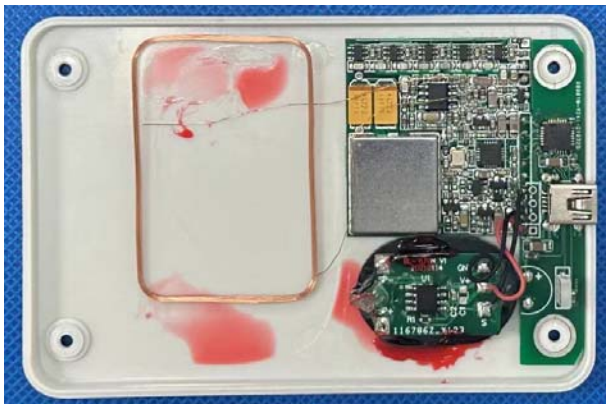
3. Connect pins 1 and 5 of the module together to a DC 5V power supply.

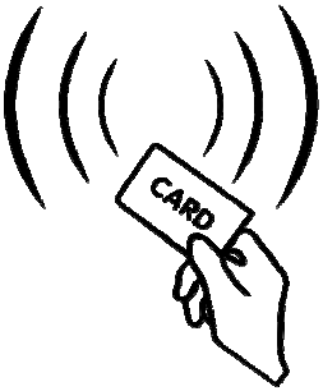


4. Connect pin 2 of the module to the power ground.

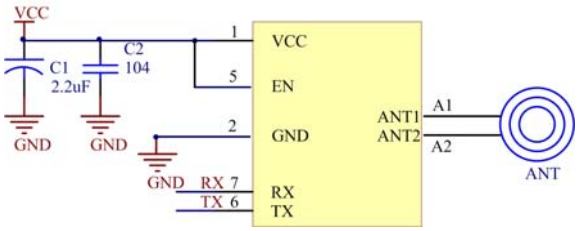


5. After turning on the power, the RFID card approaches the antenna, and the module will read the RFID card number and output it to the host.

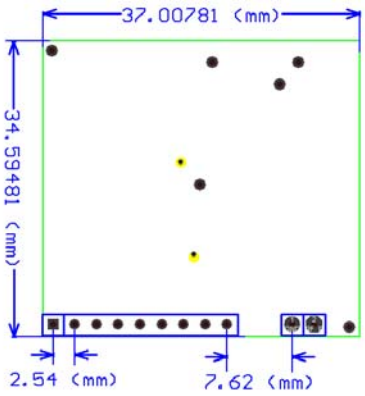




2.4 Application Circuit Diagram



3. Mechanical Dimensions



Mechanical dimensions：37mm*34.6mm*9.5mm

4. Product Selection Model

Product Name	Model	Interface	Communication Protocol	Baud Rate	Data Format
RFID READER MODULE	JY-LD6900	UART	Universal Free Protocol See Annex 1 for details	9600	ASCII
	JY-LD6900M	UART	MODUBUS RTU See Annex 2 for details	19200	HEX

5. Antenna Selection Model

Product Name	Model	Size	Detail
Antenna	JY-LTX62	Diameter 62mm	Default
	JY-LTX133	Diameter 133mm	Pick Out And Buy
	JY-LTX215	Diameter 215mm	Pick Out And Buy

6. Industry RFID Tag Selection Model

Shape	Model	Size	Mounting holes	Reading distance	Detail
	JY-T242E	Φ24*2mm	No	0-160mm	Round coin type tag，Pressure, high temperature and corrosion resistance
	JY-T251E	Φ25*1mm	No	0-110mm	Round coin type tag，PVC material
	JY-T305AE	Φ30*5mm	Φ4.0mm	0-130mm	Middle hole round coin type tag，ABS material

	JY-T253AE	Φ25*3mm	Φ4.0mm	0-160mm	Middle hole round coin type tag，Pressure, high temperature and corrosion resistance
	JY-T303AE	Φ30*3mm	Φ5.0mm	0-180mm	Middle hole round coin type tag，Pressure, high temperature and corrosion resistance
	JY-T354AE	Φ35*3mm	Φ5.0mm	Air test：0-160mm Metal：0-110mm	Middle hole round coin type tag，Pressure, high temperature and corrosion resistance
	JY-T368E	Φ8*36mm	No	0-160mm	Nail type tag，ABS material
	JY-T8654E	86*54*1mm	No	0-170mm	Standard card type tag，PVC material

Note:Test Antenna JY-LTX62

7. Animal RFID Tag Selection Model

Shape	Model	Size	Mounting holes	Reading distance	Detail
	JY-DT148	1.4*8mm	134.2K	0-80mm	EM4305 chip, bio-glass package.
	JY-DT212	2*12mm	134.2K	0-120mm	EM4305 chip, bio-glass package.
	JY-DT315	3*15mm	134.2K	0-60mm	EM4305 chip, bio-glass package.
	JY-DT006	30*15mm	134.2K	1-200mm	EM4305 chip, TPU material.
	JY-DT005	83*11mm	134.2K	0-120mm	EM4305 chip, TPU material.
	JY-DT004	12*25mm	134.2K	0-80mm	EM4305 chip, PP material.

	JY-DT001	12*13mm	134.2K	0-60mm	EM4305 chip, PP material.

Note:Test Antenna JY-LTX62

8. Matching Selection Model

NAME	Model	Features	Explanation
Low Frequency Encoder	JY-L8632	Coding the tag	Write site information

9. Disclaimer

- **Development Prerequisite Knowledge**

JY-LD6900 Series RFID reader module will try our best to provide comprehensive development templates, drivers and application description documents for the convenience of users，However, users are also required to be familiar with the hardware platform and development language used by their design products.

- **EMI And EMC**

JY-LD6900 Series RFID reader module the mechanical structure determines its EMI and EMC performance must be different from the integrated circuit design。Reader's EMI and EMC performance meets most applications.If users have special requirements, please contact us in advance.

- **Right To Modify The Document**

Guangzhou EF Information Technology Co., Ltd. reserves the right to modify the relevant documents of JY-LD6900 Series RFID reader module at any time without prior declaration.

Annex 1

Universal Free Protocol And Communication Description

Apply to JY-LD6900

Communication Interface

Communication Interface：TTL

Data Format：1 start bit, 8 data bits, no parity bit, 1 stop bit

Baud rate：9600

Output data format：ASCII

Tuning parameters

After the reader is powered on, the self-check tuning program is started, and the tuning parameters will be sent out after the tuning is completed, which can be used to evaluate the runtime environment of the reader. The data format is as follows:

【Data frame header B5】+【Tuning table】+【Tuning point】

[Data frame header]: 1 byte

[Tuning table]: 32 bytes

[Tuning point]: 1 byte

Data communication

Reader supports three communication modes: AutoSend mode (default), ReSend mode and ReRead mode.

AutoSend mode (default):

The tag enters the field area once and returns 2 packets of data at most, until the tag enters the induction area again after 200ms after leaving the induction area, or the Reader detects a new tag.

ReSend mode:

The control host can request the Reader to send the tag data sent last time by sending the $S# command. When the control host receives data error, the label data can be obtained again through this command.

ReRead mode:

The control host can send the $R# command to request the reader to rescan the sensing area and read the tag data in the sensing area.

Reader antenna is on by default. If you need to change the configuration, you can send the corresponding command. $O# represents antenna on and $C# represents antenna off.

Reader supports two formats of EMID and FDX-B electronic tags, the signal output data format is as follows:

Output Data	$F9000026000969327C#$F9000026000969327C#(Output 2 times per card reading)				
Data length	1bit	1bit	15bit	2bit	1bit
ASCII Value	$	E /F	9000026000969327	7C	#
HEX Value	24	46	39 30 30 30 30 32 36 30 30 30 39 36 39 33 32	37 43	23

Meaning	Data header	EM/FDXB	15bit decimal card number card number, consistent with the silk screen on the card	Check value	Data tail

BCC check value calculation method: XOR operation is performed on the 16-bit HEX numbers from F to the end of the card number.

For example, the card silk screen 90000260009693, the module outputs $F9000026000969327C#, where $ is the data header, and F is the FDX-B label,

900002600096932 is the card number, 7C is the check value, and # indicates the end of the data.

The calculation method of the BCC check value is: 46^39^30^30^30^30^32^36^30^30^30^39^36^39^33^32 = 0X7C

Note: EMID is a 10-bit data encoding format (preceded by country code and 00), FDX-B is a 15-bit data encoding format.

For example, EMID card silkscreen 0002327100, sensor output data is $E01700000232710076#

Data segmentation	$	E	017	00	0002327100	76	#
Meaning	Data header	EMID card	Customer code	Two complement 0	Card number	Check value	Data tail

For example, FDX-B card silk screen 900002600096965, sensor output data is $F9000026000969657E#

Data segmentation	$	F	900002600096965	7E	#
Meaning	Data header	FDX-B card	Card number	Check value	Data tail

Annex 2

MODBUS RTU Protocol And Communication Description

Apply to JY-LD6900M

Serial port configuration (8 data bits):

Baud rate	19200
verification	1 bit even parity
Stop bit	1 bit

System configurable content: (hexadecimal communication)

1. Antenna switch and response mode. In (slave active transmission) mode, the reader will actively send card reading data to the bus after reading the card; in (master-slave mode), the reader will not actively return data, and will not reply until the host accesses. . This configuration data will not be saved when the power is off, and it needs to be configured every time the power is turned on. (Hexadecimal communication)

Host sends commands	Configuration content	Reader returns	Remarks
02 06 00 00 00 03 C9 F8	The antenna is on, and the slave sends actively	02 06 00 00 00 03 C9 F8	Usually used in a master-slave communication
02 06 00 00 00 02 08 38	Antenna on, master-slave mode	02 06 00 00 00 02 08 38	
02 06 00 00 00 01 48 39	The antenna is off, and the slave sends actively	02 06 00 00 00 01 48 39	
02 06 00 00 00 00 89 F9	Antenna off, master-slave mode	02 06 00 00 00 00 89 F9	

2.The redundant data length and the reader address. The redundant data is sent by some cards in addition to the card number and country code, but also other data. The current product supports access to up to 20 bytes of data (160 bits). This configuration data is saved and will not be lost after power off. (Hexadecimal communication)

Host sends commands	Configuration content	Reader returns	Remarks
02 06 00 01 A0 02 21 F8	A0 (160) bits. Address 0x02 (range: 1-247)	02 06 00 01 A0 02 21 F8	160 bits of data after reading, the address is configured as 0x02
02 06 00 01 00 02 59 F8	No data added (range: 0-160), address 0x02 (range: 1-247)	02 06 00 01 00 02 59 F8	When the configuration value is out of the range, the return value is normal, but the system ignores it.

Read data: (hexadecimal communication)

1. Read the antenna switch and response mode information. (Hexadecimal communication)

Host sends commands	Configuration content	Reader returns	Remarks
02 03 00 00 00 01 84 39	Read back 0x00 address information	02 03 02 00 03 BC 45	The antenna is on, and the slave sends actively

2. After reading, the data length, address, and version number are included. (Hexadecimal communication)

Host sends commands	Configuration content	Reader returns	Remarks
02 03 00 01 00 04 15 FA	Read back 0x01-0x04 address information	02 03 08 A0 02 17 05 B1 FA 00 01 BA C1	With data length 0xA0, address: 0x02, version information: 17 05 B1 FA 00 01

3. Read system tuning status information (hexadecimal communication)

Host sends commands	Configuration content	Reader returns	Remarks
02 03 00 05 00 09 95 FE	Read back 0x05-0x0D address information	02 03 12 B5 3F 50 62 81 9C B9 B6 98 8A 70 60 52 4A 41 3C 37 05 26 AA	System tuning status information, used to view the working status of the module, usually not read

4. Card reading data reading: (hexadecimal communication)

Host sends commands	Configuration content	Reader returns	Remarks
02 03 00 0E 00 07 65 F8	Read back 0x0E-0x15 address information, the length is 0x07	02 03 0E 02 62 07 B6 60 CB 53 00 80 00 00 00 00 3E DC F6	Read card information such as card number
02 03 00 0E 00 11 E4 36	Read back 0x0E-0x1F address information, the length is 0x11	02 03 22 02 62 07 B6 60 CB 53 80 80 00 00 00 11 11 11 11 22 22 22 22 33 33 24 55 25 25 45 53 55 84 53 43 FF 20 D5 CF	Read card number information and data information

The length of the card reading data can be from 0x07-0x11 (that is, the readback information address can be from (0x0E-0x15) to (0x0E-0x1F)).

Send command analysis (02 03 00 0E 00 07 65 F8)

02: slave address;

03: Read function (MODBUS-RTU);

000E: read register address;

0007: Read data length (7 words 14 Bytes);

65F8: CRC check value of all previous data (02 03 00 0E 00 07), low byte is sent first.

Analysis of received commands: (02 03 0E 02 62 07 B6 60 CB 53 00 80 00 00 00 00 3E DC F6)

02: slave address;

03: Read function (MODBUS-RTU);

0E: Read back data length (14 Bytes);

0262: Country code (decimal 610)

07B660CB53: Card number data (33124567891 in decimal)

00: 0000b The lowest bit of 0000b represents whether the added data is valid (0 invalid, 1 valid), and the other 7 bits are undefined data.

80: 1000 0000b The highest bit represents the animal mark, and the other 7 bits are undefined data.

000000: Other data in the card, undefined data.

00: Data transmission supplements enough even number bytes (14 Bytes), meaningless

3E: The card reading time of the current data (0x3E*0.02s) proves to be read before 1.24s, and it is calculated up to 5.1s before.

DCF6: CRC check of the entire previous data packet (02 03 0E 02 62 07 B6 60 CB 53 00 80 00 00 00 00 3E). DC is the low byte, F6 is the high byte.

Analysis of received commands: (02 03 22 02 62 07 B6 60 CB 53 80 80 00 00 00 11 11 11 11 22 22 22 22 33 33 24 55 25 25 45 53 55 84 53 43 FF 20 D5 CF)

02 03 22 02 62 07 B6 60 CB 53 80 80 00 00 00: consistent with the above analysis.

11 11 11 11 22 22 22 22 22 33 33 24 55 25 25 45 53 55 84 53 43: 20 bytes of post-added data.

FF: It is meaningless to add enough even bytes (34 Bytes) for data transmission.

20: The card reading time of the current data (0x20*0.02s) proves to be read 0.64s ago, and it is calculated up to 5.1s ago.

D5CF: CRC check of the entire data packet before, D5 is the low byte, CF is the high byte.

The way the slave machine actively sends information: the machine will send a frame of data immediately after it reads the card. If the card does not leave the data, it will not be sent repeatedly. If the card leaves for more than 0.2s and then enters the machine, it will send another frame of data (every time the card enters Will send a frame of data to the bus in real time)

When the Reader is configured as the slave active sending mode, the reader will immediately send the card number information to the bus when the card is read. The length of the information can be configured. For example, we will configure the post-added data length to 30 bits (not sent after 16 bits). Data, with data after it is valid from 16-160), 35 bits are 4 bytes, 3 bits need 5 bytes to send, so the string data length is 12 (card number information length) + 5=17 bytes, but because The data length must be an even number (words), so a random number must be added later, that is, 18. So the composition of the string is 0xxx (slave address) + 0x03 (function) + 0x12 (18 bytes) + 18 bytes of data + 2 bytes of CRC. A total of 23 bytes. (If the data is added later, it is best to configure 0 if there is no need, which is beneficial to data transmission)

For example, add data configuration A0 (160 bits, 20 bytes). The data received when the card has post-added data is:

03 03 20 02 62 07 B6 60 CB 53 01 80 00 00 00 11 11 11 11 22 22 22 22 33 33 24 55 25 25 45 53 55 84 53 43 C1 26

03: slave address;

03: Read function (MODBUS-RTU);

20: Read back data length (32 Bytes);

0262: Country code (decimal 610)

07B660CB53: Card number data (33124567891 in decimal)

01: 0000 0001b The lowest bit represents whether the added data is valid (0 invalid, 1 valid), and the other 7 bits are undefined data.

80: 1000 0000b The highest bit represents the animal mark, and the other 7 bits are undefined data.

000000: Other data in the card, undefined data.

11 11 11 11 22 22 22 22 22 33 33 24 55 25 25 45 53 55 84 53 43: Yes, add 20 bytes of data.

C126: CRC check.

Read the data after configuring the appended data as 0: 02 03 0C 02 62 07 B6 60 CB 53 01 80 00 00 00 17 35

02: slave address;

03: Read function (MODBUS-RTU);

0C: Read back data length (12 Bytes);

0262: Country code (decimal 610)

07B660CB53: Card number data (33124567891 in decimal)

01: 0000 0001b The lowest bit represents whether the added data is valid (0 invalid, 1 valid), and the other 7 bits are undefined data.

80: 1000 0000b The highest bit represents the animal mark, and the other 7 bits are undefined data.

000000: Other data in the card, undefined data.

1735: CRC check

Factory default configuration: add data length 0 after slave address 02

Reset configuration: standard master-slave mode open antenna

So if you want Reader to read the card, send the data: After powering on, send the command: 02 06 00 00 00 03 C9 F8

This protocol conforms to the MODBUS-RTU standard and supports the broadcast monitoring function of address 0 (it can be used to configure the slave address and other information). But the broadcast command slave does not reply.

CRC check function:

```
unsigned int CRC16_MB(unsigned char *cBuffer, unsigned int iBufLen)
{
    unsigned int i, j;
    unsigned int wPolynom = 0xa001;
    unsigned int wCrc     = 0xffff;
    for (i = 0; i < iBufLen; i++)
    {
        wCrc ^= cBuffer[i];
        for (j = 0; j < 8; j++)
        {
            if (wCrc &0x0001)
            {
                wCrc = (wCrc >> 1) ^ wPolynom;
```

```
                }
                else
                {
                    wCrc = wCrc >> 1;
                }
            }
        }
        return wCrc;
}
```

Appendix:

Device address	com mand	Register address	content	Realized function
02	06	00 00 (After configuration, the power will not be saved)	b15-b3: No definition, (default after power-on: 00 02)	b0==1: Slave active transmission is usually used in a master-slave communication
				b0==0: master-slave mode
				b1==1: antenna on
				b1==0: antenna off
				b2==1: In the slave active sending mode, the card continuously sends data after reading
				b2==0: In the slave active sending mode, the card enters the field once to send data once
		00 01 (Save after power off after configuration)	A0 02	After reading, with data 160 (0xA0) bits, the device address is configured as 0x02
			00 02	No data added, device address 0x02
	03	00 00	00 01	Return 0x00 address information, that is, antenna status and transmission mode
		00 01	00 04	Followed by data length and address and version information
		00 05	00 09	System tuning status information, used to view the working status of the module, usually not read
The above command only supports reading and writing in the above format				
02	03	00 0E	00 01 ~ 00 11	Read card number information and data information

2.2 List of applicable FCC rules

List the FCC rules that are applicable to the modular transmitter. These are the rules that specifically establish the bands of operation, the power, spurious emissions, and operating fundamental frequencies.

DO NOT list compliance to unintentional-radiator rules (Part 15 Subpart B) since that is not a condition of a module grant that is extended to a host manufacturer. See also Section 2.10 below concerning the need to notify host manufacturers that further testing is required.3

Explanation: This module meets the requirements of Part 15 Subpart C Section 15. 209

2.3 Summarize the specific operational use conditions

Describe use conditions that are applicable to the modular transmitter, including for example any limits on antennas, etc. For example, if point-to-point antennas are used that require reduction in power or compensation for cable loss, then this information must be in the instructions. If the use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual. In addition, certain information may also be needed, such as peak gain per frequency band and minimum gain, specifically for master devices in 5 GHz DFS bands.

Explanation: The EUT uses Coil Antenna, antenna gain: 0dBi. There is no restriction on the installation method. This module is only installed on its own products and will not be sold to consumers

2.4 Limited module procedures

If a modular transmitter is approved as a "limited module", then the module manufacturer is responsible for approving the host environment that the limited module is used with. The manufacturer of a limited module must describe, both in the filing and in the installation instructions, the alternative means that the limited module manufacturer uses to verify that the host meets the necessary requirements to satisfy the module limiting conditions.

A limited module manufacturer has the flexibility to define its alternative method to address the conditions that limit the initial approval, such as: shielding, minimum signaling amplitude, buffered modulation/data inputs, or power supply regulation. The alternative method could include that the limited module manufacturer reviews detailed test data or host designs prior to giving the host manufacturer approval.

This limited module procedure is also applicable for RF exposure evaluation when it is necessary to demonstrate compliance in a specific host. The module manufacturer must state how control of the product into which the modular transmitter will be installed will be maintained such that full compliance of the product is always ensured. For additional hosts other than the specific host originally granted with a limited module, a Class II permissive change is required on the module grant to register the additional host as a specific host also approved with the module.

Explanation: No RF shielding. The module is a limited module.

2.5 Trace antenna designs

For a modular transmitter with trace antenna designs, see the guidance in Question 11 of KDB Publication 996369 D02 FAQ – Modules for Micro-Strip Antennas and traces. The integration information shall include for the TCB review the integration instructions for the following aspects: layout of trace design, parts list (BOM), antenna, connectors, and isolation requirements.4

a) Information that includes permitted variances (e.g., trace boundary limits, thickness, length, width, shape(s), dielectric constant, and impedance as applicable for each type of antenna);

b) Each design shall be considered a different type (e.g., antenna length in multiple(s) of frequency, the wavelength, and

antenna shape (traces in phase) can affect antenna gain and must be considered);

c) The parameters shall be provided in a manner permitting host manufacturers to design the printed circuit (PC) board layout;

d) Appropriate parts by manufacturer and specifications;

e) Test procedures for design verification; and

f) Production test procedures for ensuring compliance.

The module grantee shall provide a notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify the module grantee that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

Explanation: No. The module uses a fixed antenna.

2.6 RF exposure considerations

It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the application conditions (mobile, portable –xx cm from a person's body); and (2) additional text needed for the host product manufacturer to provide to end users in their end-product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).

Explanation: This module complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The device is portable, and the use distance is 5mm. This module is designed to comply with the FCC statement, FCC ID is: 2BGFT-JY-LD6900.

2.7 Antennas

A list of antennas included in the application for certification must be provided in the instructions. For modular transmitters approved as limited modules, all applicable professional installer instructions must be included as part of the information to the host product manufacturer. The antenna list shall also identify the antenna types (monopole, PIFA, dipole, etc. (note that for example an "omni-directional antenna" is not considered to be a specific "antenna type")).

For situations where the host product manufacturer is responsible for an external connector, for Example with an RF pin and antenna trace design, the integration instructions shall inform the installer that unique antenna connector must be used on the Part 15 authorized transmitters used in the host product. The module manufacturers shall provide a list of acceptable unique connectors.

Explanation: The EUT uses Coil Antenna, antenna gain: 0dBi.

2.8 Label and compliance information

Grantees are responsible for the continued compliance of their modules to the FCC rules. This includes advising host product manufacturers that they need to provide a physical or e-label stating "Contains FCC ID" with their finished product. See Guidelines for Labeling and User Information for RF Devices –KDB Publication 784748.

Explanation: The host system using this module, should have label in a visible area indicated he following texts: "Contains FCC ID: 2BGFT-JY-LD6900

2.9 Information on test modes and additional testing requirements5

Additional guidance for testing host products is given in KDB Publication 996369 D04 Module Integration Guide. Test modes should take into consideration different operational conditions for a standalone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

The grantee should provide information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host. Grantees can increase the utility of their modular transmitters by providing special means, modes, or instructions that simulates or characterizes a connection by enabling a transmitter. This can greatly simplify a host manufacturer's determination that a module as installed in a host complies with FCC requirements.

Explanation: Data transfer module demo board can control the EUT work in RF test mode at specified test channel

2.10 Additional testing, Part 15 Subpart B disclaimer

The grantee should include a statement that the modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuity), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Explanation: the grantee is responsible for compliance to any other FCC rules and notice that the final host should be required part 15 subpart B testing when the modular transmitter installed, when it also contains unintentional-radiator digital circuity.