

## **Instruction Manual**

Model : LRM-03S-D

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# LoRa-DTU Wireless Module

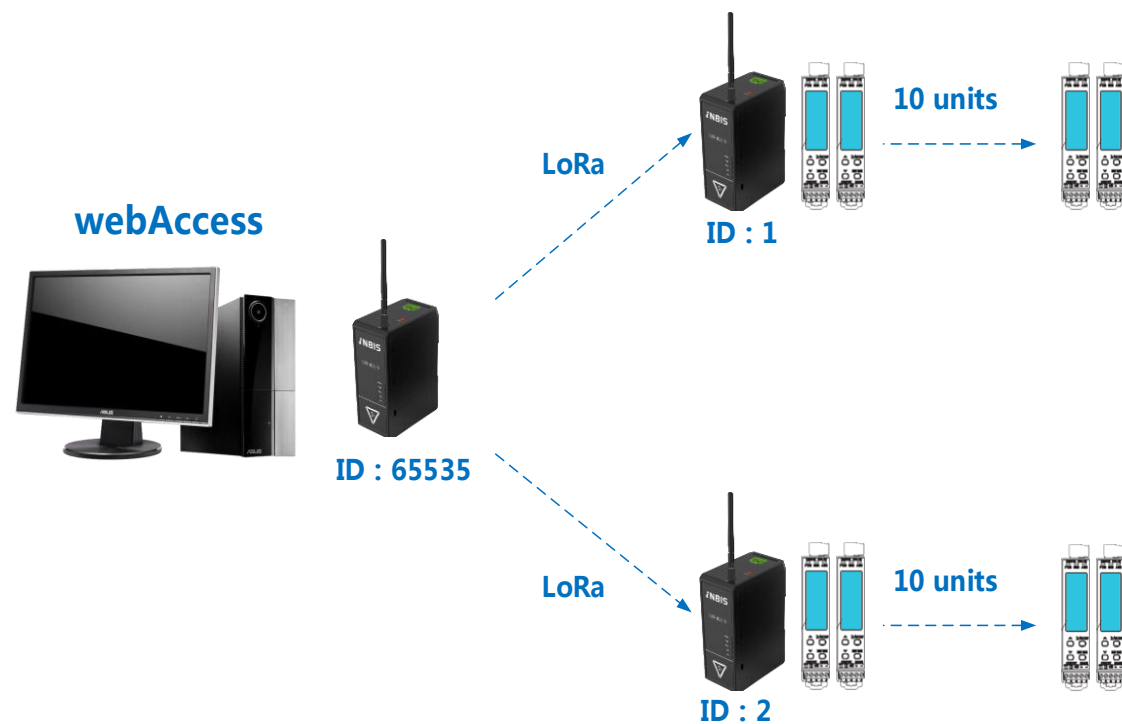
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## 1. Product Overview

This module is a wireless data transmission radio using LoRa modulation technology, working in (903MHz -- 927MHz) frequency band, the module provides transparent RS485 interface, adopts plastic shell, guide mounting structure, support 8 ~ 28V (DC) voltage input.

LoRa spread spectrum technology will bring longer communication distance, and has the advantage of strong anti-interference ability.

## 2. Application architecture diagram



# LoRa-DTU Wireless Module

## 3. Product Unit Description



Serial Number	Name	Features	Instructions
1	DI	DI input or pulse	External switching input or high speed pulse
2	DO	DO output	Control external switching quantity
3	ANT	Rf interface	SMA-K, inner hole with external thread
4	PWR	Power indicator	Light up when power is on
5	TXD	Send indicator light	Flash when sending data
6	RXD	Receiving indicator light	Flash when receiving data
7	MO	Pattern indicator	Working mode indicator
8	M1	Pattern indicator	Working mode indicator
9	Mode	Mode toggle button	Work mode toggle control
10	AI	AI Input	External analog input
11	RS485	RS485 communication port	Standard RS485 interface
12	DC	Power port	Dc power input port, pressure cable port

# LoRa-DTU Wireless Module

## 4. Technical parameter index

### 4.1 Frequency range and number of channels

Model Specification	Default frequency	Band range	Channel spacing	Number of channels
	Hz	Hz	Hz	
LoRa-DTU(485)	922M	903-- 927MHz	1000k	25, half duplex

★ Note: When multiple groups of data stations are used in the same area for one-to-one communication at the same time, it is recommended that each group of data stations set a channel interval of more than 2MHz.

### 4.2 Air rate rating

Model Specifications	Default air rate	Number of levels	Air rate rating
	bps		bps
LoRa-DTU(485)	9.6 k	6	Adjustable, adjust between 0.3 and 19.2

★ Note: The higher the air rate setting, the faster the transmission rate and the closer the transmission distance; Therefore, in the case that the rate meets the requirements of use, it is recommended that the lower the air rate is the better.

★ Note: It is recommended that the air speed setting in engineering applications is better than or equal to the serial port baud rate.

★ Note: It is recommended that the installation position of engineering application equipment is more than 2 meters above the ground.

### 4.3 Sending and receiving length and subcontracting method

Model Specification	Cache size
LoRa-DTU(485)	Enter a packet of 58 bytes at a time, more than subcontract

# LoRa-DTU Wireless Module

## 5. Configuration Instructions

LoRa-DTU(485) configuration PC display interface (Figure 5.1), the user can switch to the configuration Mode through the mode key, the parameters in the PC quickly configuration and read.

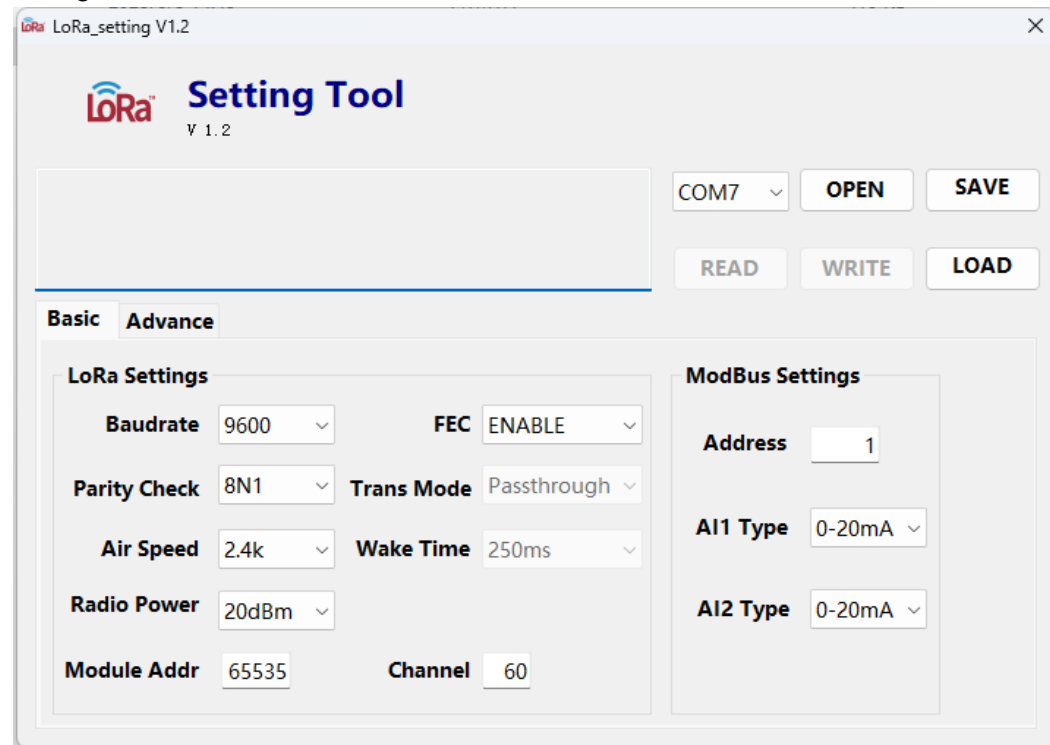
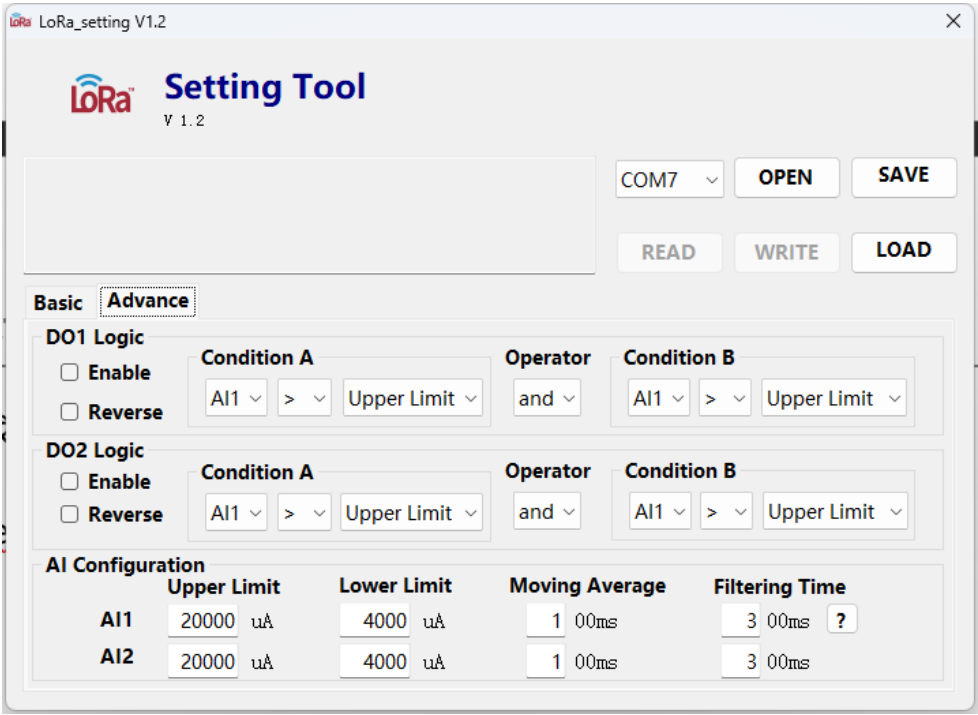


Figure 5.1

Air Rate: The higher the air rate setting, the faster the transmission rate and the closer the transmission distance; Therefore, in the case that the speed meets the requirements of use, it is recommended that the lower the air speed is better.

3. RadioPower: The higher the transmit power, the greater the signal strength.

# LoRa-DTU Wireless Module



Advanced properties control the Do output according to the set logical conditions.

## 6. Working mode

LoRa-DTU(485) has two working modes, the need for normal communication requires the radio to be configured as transparent mode (mode 0) by pressing the button, the radio is default set to transparent mode (mode 0) when the factory.

Mode	Categories	M1	M0	Notes
Mode 0	General Mode	OFF	OFF	Serial on, wireless on, transparent transfer (factory default mode)
Mode 1	Command Mode	ON	ON	Radio stations can be configured using configuration software

# LoRa-DTU Wireless Module

## 7. Hardware Description

**1. Type : LRM-03S-D**

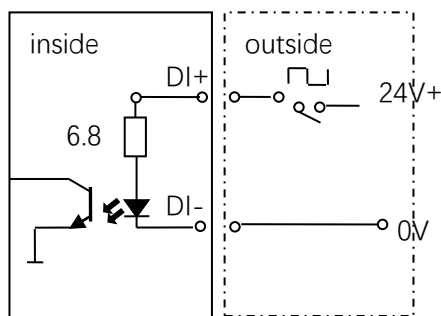
**2. Power Supply : DC8-28V**

**3. Frequency Range: 903MHz -- 927MHz**

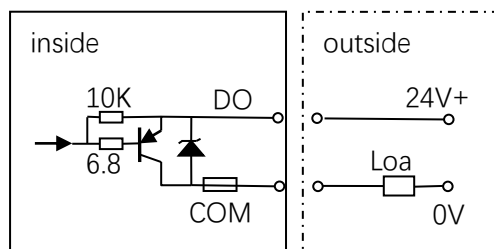
**4. Ports:**

(1) One channel RS485

(2) Two circuit DI : Two high and low level contact inputs, or high-speed pulse (1-2KHz) input counting; circuit isolation; Optoelectronic isolation; Input impedance  $\geq 6k \Omega$ ; It is recommended to use twisted pair shielded wire to capture the rising edge count.

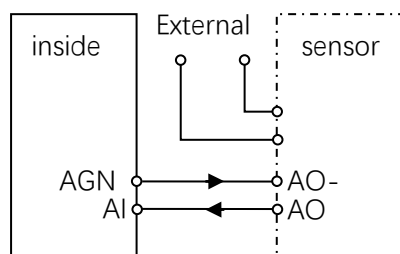


(3) Two circuit DO: Two circuit transistor output; Contact capacity 24VDC 400mA;



(4) Two channel 12 bit resolution sampling; Resolution:  $5 \mu A$ ; Sampling period:  $\leq 100ms$ ;

DC current 0-20mA or voltage signal 0-5V;





### 5. Peripheral 485 protocol address

- modbus station number Address 1 Set the modbus address to 40002.
- The two DI addresses 0 to 1 modbus addresses are 10001, 10002.
- The modbus addresses of the two DO addresses 0 to 1 are 00001, 00002.
- The modbus addresses of the two AI addresses 0 to 1 are 30001, 30002, and the unit of current type is uA. The unit of voltage type is mV.
- When the input signal is 2V, the actual data collected is 2000mV.
- When the input signal is 4mA, the actual data collected is 4000uA.
- AI1 Input type address 7 modbus address is 40008, 0 is 0-20mA, and 1 is 0-5V.
- AI2 Input type address 8 modbus address is 40009, 0 is 0-20mA, and 1 is 0-5V.
- DI1 and DI2 access pulse signals
- DI1 pulse Clear modbus address 00003,
- DI2 Pulse Clear modbus address 00004,
- The number of DI1 pulses is collected using modbus address 40037 and 40038. The data type is unsigned and integer 32-bit.
- Statistics of pulse times of DI2 Statistics of pulse times using modbus address 40039 and 40040, data type unsigned shaping 32 bits,
- Note: When using high frequency pulse signal input, it is recommended to use twisted-shielded servo code line.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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.

FCC Statement: 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

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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 equipment should be installed and operated with minimum distance 20cm between the radiator and your body

Note: It is recommended that the installation position of engineering application equipment is more than 2 meters above the ground.