

## PDDAXLQUE LR03-433/475Mhz SET

# DX-LR03 LoRa Module Instruction Manual

Brand: PDDAXLQUE | Model: LR03-433/475Mhz SET

## 1. INTRODUCTION

The DX-LR03 is an ultra-long distance LoRa communication module developed by PDDAXLQUE. This module supports 433/475Mhz frequency band communication and integrates a PA amplifier, enabling a transmission power of up to 30dBm. It utilizes UART serial port for data transmission, achieving communication distances of up to 10 kilometers in optimal conditions. This manual provides essential information for the setup, operation, and maintenance of your DX-LR03 LoRa module.



Image 1.1: Overview of the DX-LR03 LoRa Module set, including two LoRa modules, two USB cables, and two antennas.

## 2. PACKAGE CONTENTS

Upon opening your DX-LR03 LoRa Module package, please verify that all the following components are included:

# LR03-433MHz Developer packages

**Suggestion:** For first-time use, it is recommended that you purchase a developer toolkit, which can help you quickly test and validate your product.

The product package contains:



Image 2.1: Contents of the LR03-433MHz Developer package. It includes two USB cables, two LR03 modules, two glue stick antennas, and two USB to TTL adapter boards.

- 2 x DX-LR03 LoRa Modules
- 2 x USB Cables
- 2 x Glue Stick Antennas
- 2 x USB to TTL Adapter Boards

*Note: For first-time use, it is recommended to purchase a developer toolkit to facilitate quick testing and product validation.*

### 3. KEY FEATURES AND SPECIFICATIONS

The DX-LR03 LoRa module is designed with advanced features for robust and long-range wireless communication. Below are its primary characteristics and technical specifications:

**Measured distance of LORA module.  
Drone measured communication distance.**

Visible distance up to 10km in the open.

**Note:** The test results come from the measured communication distance in an open area, and the specific values are subject to actual measurement.



Image 3.1: Detailed key features and specifications of the DX-LR03 LoRa Module, including physical dimensions and pinout.

**Key Features:**

- **ASR6601 SOC Chip + PA Amplifier:** Integrated chip for efficient processing and power amplification.
- **Long Range 10km:** Capable of transmitting data up to 10 kilometers in open environments.
- **32-bit ARM STAR Core:** High-performance core with a maximum frequency of 48MHz.
- **UART Serial Communication:** Supports transparent data transmission between devices.
- **Abundant AT Commands:** Configurable via AT commands for various parameters.
- **Global Compatibility:** Supports 410-493MHz frequency range.
- **High Output Power:** Up to +30dBm.
- **Maximum Receiver Sensitivity:** -142dBm.
- **Sleep Mode & Wake on Air Mode:** Power-saving features.
- **Operating Voltage:** 4V-5.5V (typical: 5V).
- **Compact Module Size:** 43(L)mm x 28(W)mm x 3.2(H)mm.
- **Certifications:** CE, FCC, RoHS compliant.

**Technical Specifications:**

Parameter	Details
Chip Model	ASR6601 SOC amplifier
Communication Interface	LPUART
Firing Power	0~+30dBm
Communication Distance	Visible distance up to 10km in the open
Frequency Band	410~493MHz
AT Instruction	Simple AT instruction set available, refer to datasheet for details
Transmission Method	Transparent transmission, Fixed-point transmission, Broadcast transmission
Operating Temperature	-40°C ~ +85°C
Operating Voltage	LR03-A: 4V ~ 5.5V (Typical 5V)

Parameter	Details
Modulation Method	Spread Spectrum Modulation
Sensitivity	-138dBm
RF Input Impedance	50Ω

## 4. SETUP AND CONNECTION

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The DX-LR03 module communicates via a UART serial port. To set up the module for initial use and testing, you will typically connect it to a computer or a microcontroller using the provided USB to TTL adapter board.

### 4.1 Hardware Connection

1. Connect the DX-LR03 module to the USB to TTL adapter board using the appropriate pins (VCC, GND, TX, RX). Ensure correct pin alignment to prevent damage.
2. Connect the antenna to the RF connector on the DX-LR03 module.
3. Plug the USB to TTL adapter board into your computer's USB port using the provided USB cable.

### 4.2 Software Setup

Once the hardware is connected, you will need serial communication software on your computer to interact with the module. This software allows you to send AT commands and receive responses from the module.

- Install the necessary USB to serial port drivers for your operating system if they are not automatically detected.
- Open a serial port debugging tool (e.g., Uart Assistant Tools, shown in Image 6.1).
- Select the correct COM port corresponding to your connected module.
- Configure the serial port parameters: The default baud rate is 9600bps, with 8 data bits, no parity, and 1 stop bit (9600/8/N/1). Other supported baud rates include 1200, 2400, 19200, 38400, 57600, 115200, and 128000.
- Open the serial port connection.

## 5. OPERATING MODES

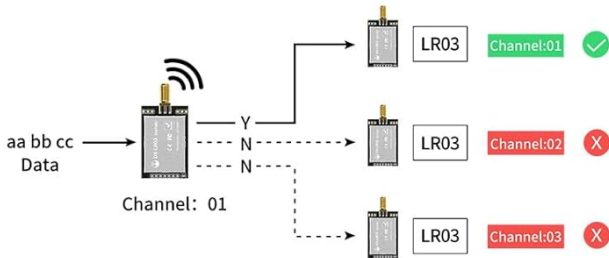
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The DX-LR03 module supports various working modes to facilitate different communication scenarios:

# Support working mode

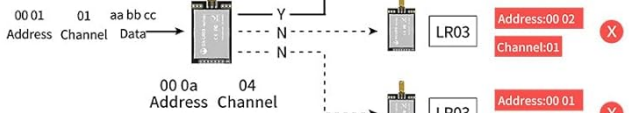
## Module and module transparent transmission

This mode requires the same channel as the sender and receiver in order to send data.



## Module and module fixed-point transmission

Communicate with modules with specified addresses and channels  
Data transmission format (hexadecimal):  
receiving address+receiving channel+data



## Modules and module broadcast transmission

Communicate with designated channel modules  
Data transmission format (hexadecimal): receiver channel+data

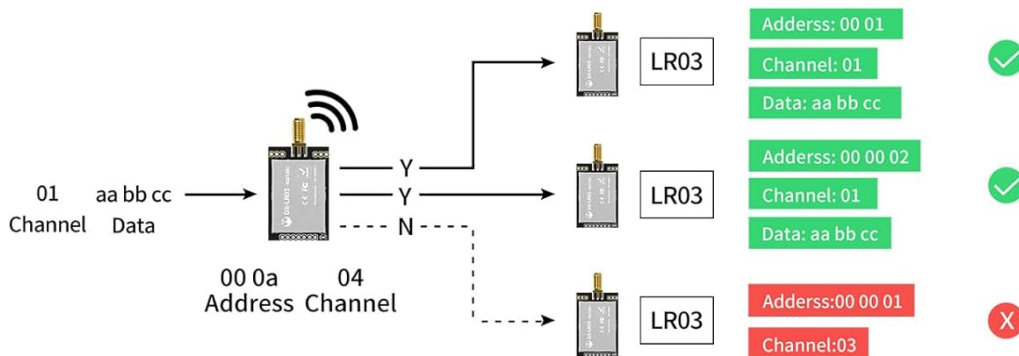


Image 5.1: Illustration of the three primary working modes supported by the DX-LR03 LoRa module.

### 5.1 Module and Module Transparent Transmission

In this mode, data is transmitted transparently between two modules. Both the sender and receiver modules must be configured to the same channel to ensure successful data exchange. This mode simplifies data transfer as no specific addressing is required beyond channel matching.

### 5.2 Module and Module Fixed-Point Transmission

This mode allows communication with specific modules by defining their addresses and channels. The data transmission format typically includes the receiving address, receiving channel, and the data itself. This enables targeted communication within a network of modules.

### 5.3 Modules and Module Broadcast Transmission

In broadcast mode, a module can transmit data to all other modules configured to a designated channel. The data transmission format usually consists of the receiver channel and the data. This is useful for sending general information to multiple modules simultaneously without needing individual addressing.

## 6. AT COMMAND SET

The DX-LR03 module is configured and controlled using a set of AT commands. These commands allow you to modify various parameters such as mode, frequency, MAC address, bandwidth, spreading factor, coding rate, and more. This eliminates the need to write complex LoRa programs, accelerating your project development.

### Regarding serial port testing software for PC

**-What is the "LoraSetting" software tool used for?**  
Support using AT commands to modify transmission mode, working channel, working power, working mode, baud rate, query device information, etc

**-AT Commands for Easy Use:**  
A rich set of AT commands can help you use the product more conveniently

**-AT command set:**

AT command	Function	Description
AT	Test Instruction	For testing serial ports
+++	Entering or exiting AT command mode	Power-up defaults to transmission mode
AT+BAUD	Setting/Querying Baud Rate	Default:4(9600)
AT+STOP	Setting/querying serial port stop bit	Default:0(0 stop bit)
AT+PARI	Set/query serial port parity bit	Default:0(no parity)
AT+MODE	Setting/querying working mode	Default:0(transparent transmission)
AT+MAC	Setting/Querying Device Address	Default:fff

\*For more AT commands, please consult the product information packages.

**(Uart Assistant Tools Screenshot)**

Image 6.1: Overview of common AT commands and a screenshot of the Uart Assistant Tools software for PC serial port testing.

### Common AT Commands:

AT Command	Command Description	Clarification / Default
AT	Test (Response OK)	For testing the serial port
+++	Enter/exit AT command mode	Power-up defaults to transmission mode
AT+BAUD	Set/query baud rate	Default: 4 (9600)
AT+MODE	Set/query operating mode	Default: 0 (transparent transmission)
AT+SLEEP	Set/query power consumption mode	Default: 2 (high time mode)
AT+CHANNEL	Set/query working channels	Default: 00
AT+MAC	Set/query device address	Default: ff ff
AT+POWE	Set/query transmit power	Default: 22dB

*For a complete list of AT commands and detailed usage, please consult the product information packages and technical documentation.*

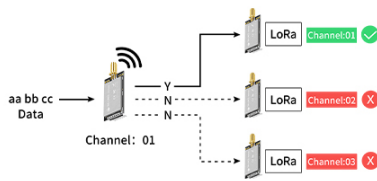
## 7. PERFORMANCE CHARACTERISTICS

The DX-LR03 module is designed for long-range communication, leveraging its ASR6601 chip and PA amplifier. Its performance has been tested to demonstrate significant communication distances.

## Support working mode

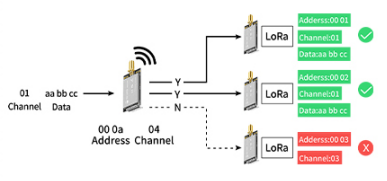
### Module and module transparent transmission

This mode requires the same channel as the sender and receiver in order to send data.



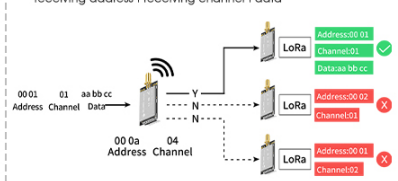
### Modules and module broadcast transmission

Communicate with designated channel modules  
Data transmission format (hexadecimal): receiver channel+data



### Module and module fixed-point transmission

Communicate with modules with specified addresses and channels  
Data transmission format (hexadecimal):  
receiving address+receiving channel+data



\*For further instructions on the use of the modules, please see the product technical manuals:  
[DX-LR03-433T30D Module\\_Serial Port UART\\_Guide](#).

\*The product description provides more detailed instructions for the operation of the product, including the way to download and install the test software on the computer side, and the detailed explanation of the relevant AT commands.

Image 7.1: Illustration of a drone-measured communication distance test, demonstrating a visible range of up to 10km in an open area, such as over water.

The module is capable of achieving a visible communication distance of up to 10 kilometers in open environments. This impressive range is attributed to its high transmission power and sensitive receiver.

*Note: The test results for communication distance are obtained from measurements in an open area. Actual communication distances may vary depending on environmental factors, obstacles, and antenna placement.*

## 8. MAINTENANCE

The DX-LR03 LoRa module is designed for durability and reliability. Regular maintenance is generally not required beyond ensuring proper handling and environmental conditions.

- **Environmental Conditions:** Operate the module within its specified temperature range of  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ . Avoid exposure to extreme humidity, dust, or corrosive substances.
- **Physical Handling:** Handle the module with care to prevent physical damage to the board, connectors, or antenna. Avoid bending or excessive force on components.
- **Antenna Connection:** Ensure the antenna is securely connected to the RF port. A loose connection can degrade performance.
- **Power Supply:** Provide a stable power supply within the recommended voltage range of 4V-5.5V (typical 5V).
- **Firmware Updates:** Periodically check the manufacturer's official resources for any available firmware updates that may improve performance or add new features.

## 9. TROUBLESHOOTING

If you encounter issues with your DX-LR03 LoRa module, consider the following troubleshooting steps:

- **No Communication:**
  - Verify that the USB to TTL adapter drivers are correctly installed on your computer.
  - Ensure the correct COM port is selected in your serial communication software.
  - Check that the serial port parameters (baud rate, data bits, parity, stop bits) match the module's default or configured settings (default: 9600/8/N/1).
  - Confirm that the module is properly powered and the VCC, GND, TX, RX pins are correctly connected.
  - Try sending the simple 'AT' command to test the serial connection. A response of 'OK' indicates a successful connection.

- **Poor Communication Range/Performance:**

- Ensure the antenna is securely attached and is the correct type for the module's frequency band.
- Check for physical obstructions between the transmitting and receiving modules. LoRa performance is significantly affected by line-of-sight.
- Verify that both modules are configured to the same frequency and channel.
- Confirm that the transmit power (POWE) setting is appropriate for your application and regulatory limits.
- Minimize electromagnetic interference from other electronic devices. The module has an RF shielding cover for anti-interference, but strong external sources can still affect performance.

- **Module Not Responding to AT Commands:**

- Ensure you are in AT command mode by sending '+++' (without quotes, no carriage return/line feed) and waiting for a response.
- Check the command syntax, including capitalization and any required parameters.
- Verify the serial port settings are correct.

For more complex issues or if the above steps do not resolve the problem, please refer to the detailed technical documentation or contact technical support.

## 10. TECHNICAL SUPPORT AND DOCUMENTATION

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PDDAXLQUE provides comprehensive technical support and documentation to assist you with the DX-LR03 LoRa module. We recommend utilizing these resources to maximize your product's functionality and accelerate development.

### Available Resources:

- **Technical Documentation:** Includes detailed product specifications, module pinouts, module dimensions, package diagrams, and hardware design references.
- **AT Command Sets:** Comprehensive guides for all available AT commands.
- **Development/Test Tools:** Software and utilities to help verify module functionality.
- **Reference Design Schematics:** For integration into your projects.

These resources are crucial for understanding the module's capabilities and for advanced configurations. We strongly recommend purchasing a development kit with your initial order to quickly verify module functionality.

### Contacting Support:

As a manufacturer, PDDAXLQUE supports OEM and ODM services. If you encounter any problems or require further assistance, please contact us through the following channels:

- Refer to the [User Guide](#) → Product Information → Service Support section for contact details.
- Utilize the contact information provided in the comprehensive product information packages.

We are committed to providing the best possible support to resolve any issues you may encounter.