

PDDAXLQUE DX-LR30-900-SET

PDDAXLQUE DX-LR30 SX1262 LoRa Module Developer Set Instruction Manual

Model: DX-LR30-900-SET

1. INTRODUCTION

This manual provides essential information for the proper setup, operation, and maintenance of your PDDAXLQUE DX-LR30 SX1262 LoRa Module Developer Set. Please read this manual thoroughly before using the product to ensure optimal performance and safety.

The DX-LR30 series utilizes the SEMTECH SX1262 chip, offering enhanced performance, extended transmission range, faster data rates, and lower power consumption compared to previous SX127X series solutions. It supports various features including air wake-up, carrier sense, and communication key functions.

Note: For first-time users, it is highly recommended to acquire a developer toolkit to facilitate quick testing and validation of the module's functionality and to accelerate product development.

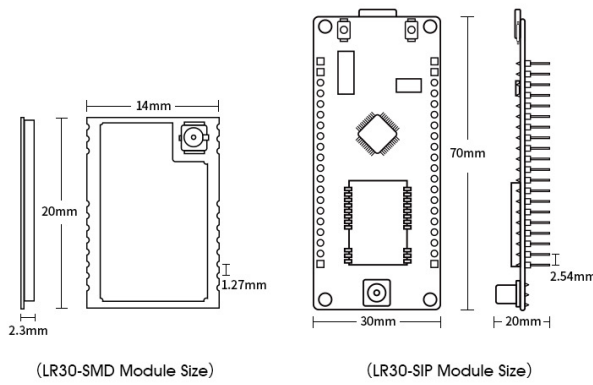
2. PRODUCT OVERVIEW

2.1 Package Contents

The DX-LR30-900-SET typically includes the following components:

- DX-LR30 Development Board (x1)
- USB Cable (x1)
- Antenna (x1)

Key Features



Parameter	Details
Chip Model	SMA Module: Semtech SX1262 Chip Development Board: STM32F103C8T6 Chip
Module Size	SMA Module: 20*14*2.3mm Development Board: 70*30*20mm
Transmission Power	0~+22dBm
Frequency Band	850~930MHz
Working Voltage	SMA Module: 1.8V~3.7V Development Board: 3.3V~5V
Transmission Distance	Open transmission distance of 8km
Hardware Interface	SPI
Working Temperature	-40~+85 °C
Crystal Oscillator Frequency	32MHz

Figure 2.1: Components included in the DX-LR30 Developer Set package.

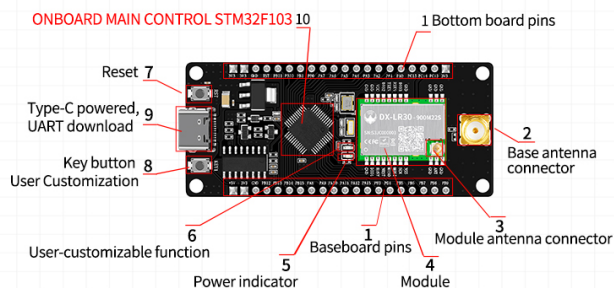
2.2 Key Features

The DX-LR30-900-SET offers a robust set of features for LoRa applications:

- **Chipset:** Semtech SX1262 chip and STM32F103C8T6 microcontroller.
- **Modulation:** Supports LoRa and (G)FSK modulation.
- **Frequency Range:** Covers 850~960MHz global Sub-GHz band.
- **Transmit Power:** Maximum transmit power up to +22dBm.
- **Receiver Sensitivity:** As low as -148dBm (LoRa mode).
- **Current Consumption:** Receive current 4.2mA, sleep current as low as 0.9μA.
- **Interface:** Supports SPI communication interface.
- **Antenna Options:** Compatible with various antenna interfaces including stamp hole/round hole and IPEX.
- **Range:** Visible open distance up to 8KM.
- **Operating Temperature:** -40°C to +85°C.
- **Power:** Type-C charging port, compatible with 3.3~5V IO port voltage.
- **Protection:** RF shielding cover, strong anti-interference, anti-static, and EMC electromagnetic compatibility.

Hardware Specification

The STM32F103 development board offers a reprogrammable, ready-to-use solution with full support for user programming. It includes a complete package (code samples, setup guides, datasheets, etc.), allowing direct code integration to speed up development.



• Provide the full set of materials •

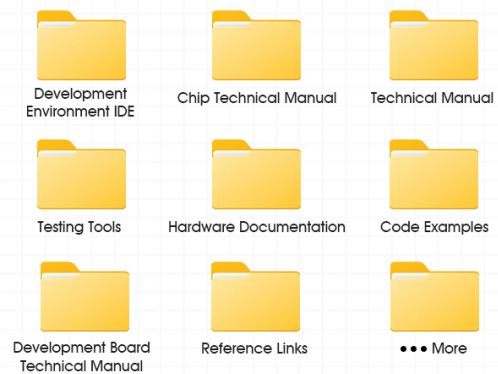


Figure 2.2: Detailed key features of the DX-LR30 module.


2.3 SX1262 Chip Advantages

The integrated Semtech SX1262 chip is a high-performance, low-power LoRa RF transceiver suitable for long-range, low-power IoT applications. It offers significant improvements over older SX127X series chips.


Multiple authentication of LR30 Module

The DX-LR30 comes with full certifications, making your product simpler, safer, and more reliable.


The module supports dual antenna options (IPEX / Stamp hole) and features a radio frequency (RF) shielding cover for strong anti-interference, ESD protection, and EMC electromagnetic compatibility.



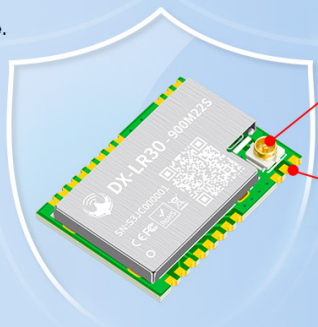
-40~+85 °C



Dustproof



Safe & Reliable



With IPEX Antenna Connector

- Uses external antenna for extended range
- Deal for complex environments

With On-board Stamp Hole Antenna (Default)

- Built-in antenna for easier integration
- Suitable for most applications

Figure 2.3: Performance comparison of SX1262 with SX1278/SX1276 chips.

2.4 Industrial Grade Quality

The DX-LR30 module is designed with industrial-grade quality, featuring professional RF shielding to effectively block external electromagnetic interference (EMI) and electrostatic interference (ESD). This ensures reliable operation in various environments.



Drone measured distance

*Clear weather, open area, transmission power of 22dBm

>8km

Starting Point

End position

LR30 Module

Figure 2.4: Industrial quality features of the DX-LR30 module.

2.5 Certifications and Antenna Options

The DX-LR30 module holds multiple certifications, contributing to product safety and reliability. It supports dual antenna options: an IPEX connector for external antennas, suitable for extended range and complex environments, and an on-board stamp hole antenna for easier integration in most applications.



Figure 2.5: DX-LR30 module antenna options and certifications.

3. SETUP AND HARDWARE OVERVIEW

3.1 Development Board Components

The DX-LR30 development board integrates key components for easy development and testing. Familiarize yourself with the layout:

1. **Baseboard pins:** For connecting to external circuits.
2. **Module antenna connector:** For connecting the external antenna.
3. **Module:** The core LoRa module.
4. **Power indicator:** Indicates power status.
5. **User-customizable function:** Programmable pin.
6. **Key button:** For user interaction.
7. **Type-C powered, UART download:** USB Type-C port for power and firmware upload.
8. **Reset:** Reset button.
9. **ONBOARD MAIN CONTROL STM32F103:** The main microcontroller.

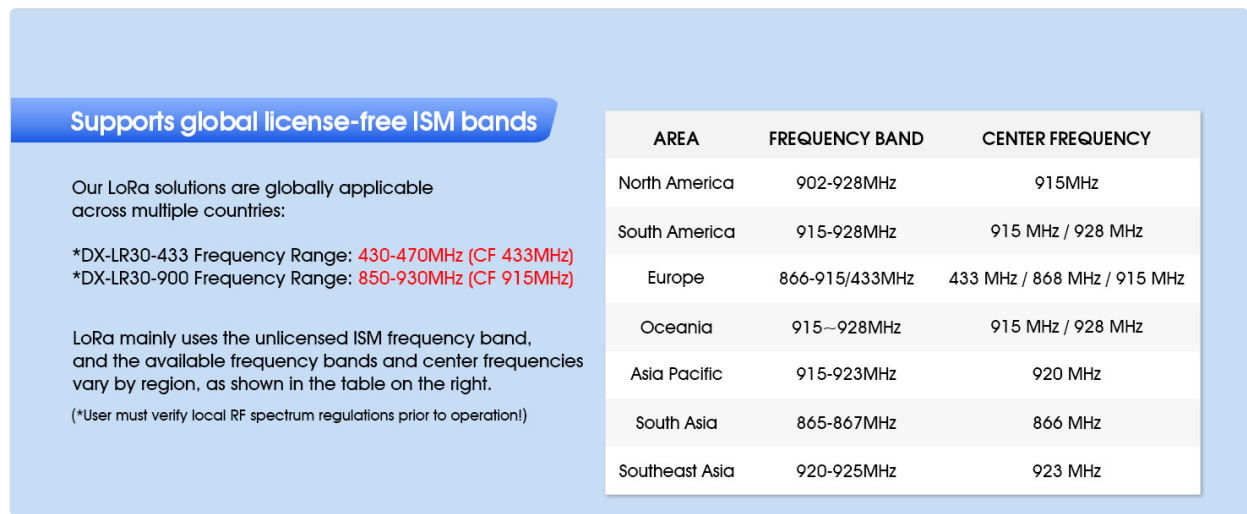


Figure 3.1: Overview of the DX-LR30 development board hardware.

3.2 Module Pin Definitions

Understanding the pin definitions is crucial for integrating the DX-LR30 module into your projects. The module provides various pins for power, ground, digital I/O, and communication interfaces.

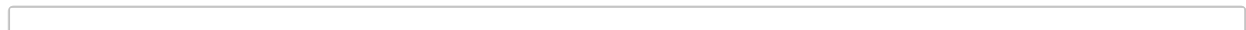


Figure 3.2: DX-LR30 Module Pin Definitions. For more detailed parameters, refer to the DX-LR30 technical manual.

4. OPERATION

The DX-LR30 module supports programming via its SPI interface and UART for communication. Firmware development is required to utilize the module's full capabilities.

- **Power Supply:** Connect the module via the Type-C port or supply 3.3V-5V to the appropriate pins.
- **Antenna Connection:** Ensure the antenna is securely connected to the module antenna connector before operation.
- **Programming:** Utilize the provided technical documentation and development tools for firmware development and uploading via the UART interface.
- **Communication:** The module communicates primarily through the SPI interface for LoRa functionality and UART for AT command control or data transfer, depending on the firmware.

5. SPECIFICATIONS

Detailed technical specifications for the DX-LR30 module:

Parameter	Details
Chip Model	Semtech SX1262 Chip, STM32F103C8T6 Chip
Module Size (SMA Module)	20(L)mm x 14(W)mm x 2.3(H)mm
Module Size (Development Board)	70(L)mm x 30(W)mm x 20(H)mm
Transmission Power	0 ~ +22dBm
Frequency Band	850-930MHz (DX-LR30-900-SET)
Working Voltage (SMA Module)	1.8V-3.7V
Working Voltage (Development Board)	3.3V-5V
Transmission Distance	Open transmission distance of 8km
Hardware Interface	SPI, UART, GPIO
Working Temperature	-40°C ~ +85°C
Crystal Oscillator Frequency	32MHz

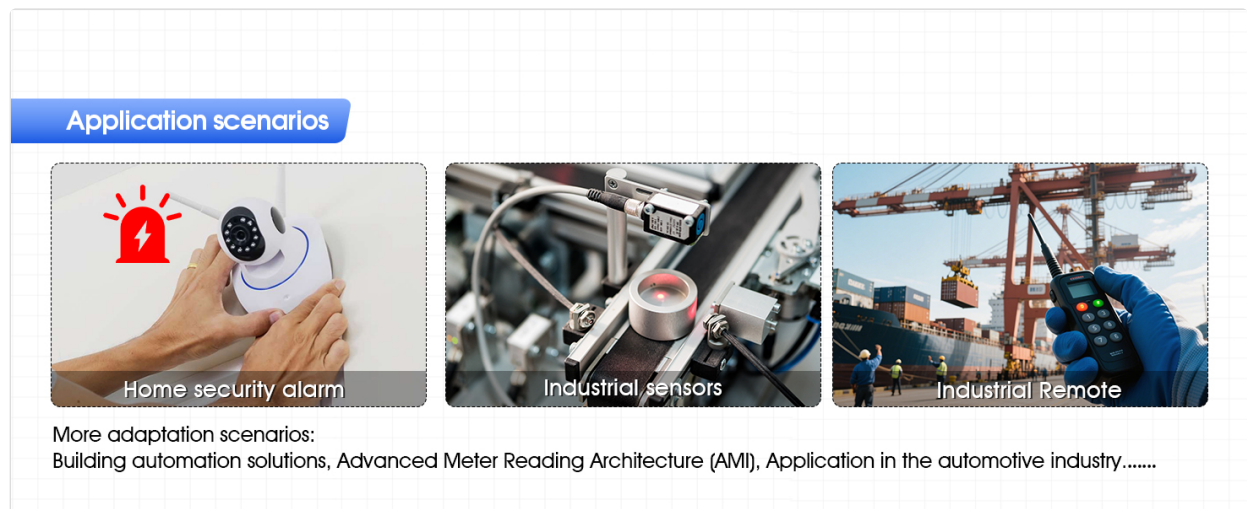


Figure 5.1: Key features and dimensions of the DX-LR30 module.

5.1 Frequency Bands

The DX-LR30 supports global license-free ISM bands. The specific frequency range depends on the module variant. For the DX-LR30-900-SET, the frequency band is 850-930MHz.



Figure 5.2: Global license-free ISM bands supported by LoRa solutions.

5.2 Transmission Range

Under optimal conditions (clear weather, open area, 22dBm transmission power), the DX-LR30 module can achieve a transmission distance of over 8 kilometers.

Figure 5.3: Demonstrated transmission distance of the LR30 module.

6. APPLICATION AREAS

The DX-LR30 LoRa module is suitable for a wide range of applications requiring long-range, low-power wireless communication:

- Home security alarm systems and remote keyless entry.
- Smart home and industrial sensor networks.
- Wireless alarm security systems.
- Building automation solutions.
- Industrial wireless remote control.
- Advanced Meter Reading Architecture (AMI).
- Automotive industry applications.

Figure 6.1: Common application scenarios for the DX-LR30 module.

7. MAINTENANCE AND TROUBLESHOOTING

7.1 Maintenance

To ensure the longevity and reliable operation of your DX-LR30 module:

- Keep the module in a clean, dry environment, away from excessive dust and moisture.
- Avoid exposing the module to extreme temperatures outside its specified operating range (-40°C to +85°C).
- Handle the module with care to prevent physical damage to components or connectors.
- Ensure proper power supply voltage (3.3V-5V) to prevent damage.

7.2 Troubleshooting

If you encounter issues with your DX-LR30 module, consider the following:

- **No Power:** Verify the power supply connection and voltage. Check the Type-C cable or pin connections.
- **Communication Failure:** Ensure correct wiring for SPI/UART. Check baud rates and communication protocols in your firmware.
- **Poor Range:** Confirm the antenna is correctly attached and undamaged. Ensure there are no major obstructions between transmitting and receiving modules. Verify transmit power settings in firmware.
- **Firmware Upload Issues:** Double-check the UART connection and driver installation. Refer to the development board's technical manual for specific programming instructions.

For complex issues, refer to the detailed technical documentation provided or contact technical support.

8. TECHNICAL SUPPORT AND RESOURCES

PDDAXLQUE provides comprehensive technical support and resources to assist with your development:

- **Technical Documents:** Access detailed datasheets, reference design schematics, and module package diagrams.
- **AT Command Set:** A complete guide to the AT command interface for module control.
- **Development/Testing Tools:** Software and hardware tools to aid in verification and development.
- **Code Examples:** Sample code to help you quickly integrate the module into your projects.

These resources are designed to help you quickly verify module functionality and accelerate product development. For any questions or further assistance, please contact PDDAXLQUE technical support.



Figure 8.1: Available professional technical documentation and resources.

9. SAFETY INFORMATION

Please observe the following safety guidelines when working with the DX-LR30 module:

- Always handle electronic components with care to prevent electrostatic discharge (ESD) damage. Use appropriate ESD protection measures.
- Ensure proper ventilation when operating the module, especially during prolonged use.
- Do not attempt to modify or repair the module beyond the scope of this manual. Unauthorized modifications may void any potential warranty and could lead to damage or injury.
- Keep the module away from water, flammable liquids, and direct heat sources.
- Dispose of electronic waste responsibly according to local regulations.