REYAX RYLR896

REYAX RYLR896 Lora Module User Manual

Model: RYLR896

1. INTRODUCTION

The REYAX RYLR896 is a Lora module designed for long-range, low-power wireless communication. It integrates the Semtech SX1276 chip and communicates via a UART interface using AT commands. This module operates in the 868MHz and 915MHz frequency bands, making it suitable for various IoT and M2M applications requiring extended range and robust connectivity.

This manual provides essential information for the proper setup, operation, and maintenance of your RYLR896 module.

2. FEATURES

- Semtech SX1276 Lora Transceiver
- UART Interface for easy communication
- Supports 868MHz and 915MHz frequency bands
- AT Command set for configuration and control
- Integrated antenna
- Low power consumption
- FCC and NCC certified

3. SPECIFICATIONS

Specification	Value
Model Number	RYLR896
Product Dimensions	1.67 x 0.72 x 0.22 inches
Item Weight	0.106 ounces
Manufacturer	REYAX

Specification	Value
Antenna Type	Radio (Integrated)
Number of Channels	208
Impedance	50 Ohms
Maximum Range	15000 Meters
UPC	755874948070, 644824865713

4. PIN DESCRIPTION

The RYLR896 module features several pins for power, communication, and control. Understanding these pins is crucial for proper integration.
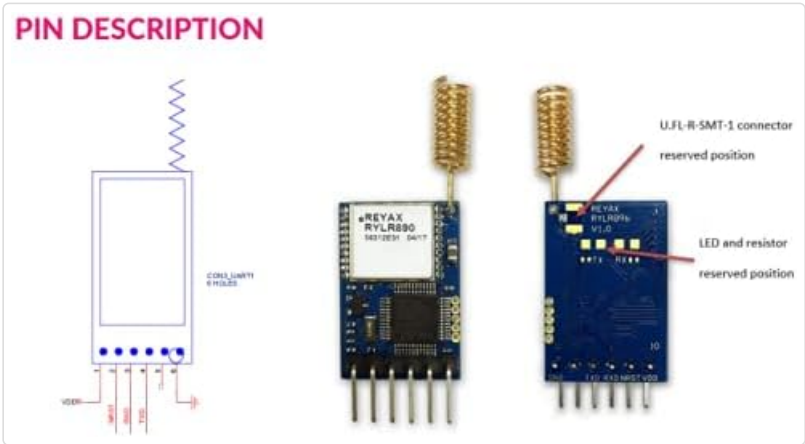

Image: Pinout diagram for the REYAX RYLR896 Lora module, showing GND, TXD, RXD, NRST, and VDD connections.

- **GND:** Ground connection.
- **TXD:** Transmit Data pin. Connects to the RXD pin of your microcontroller or UART bridge.
- **RXD:** Receive Data pin. Connects to the TXD pin of your microcontroller or UART bridge.
- **NRST:** Reset pin. Can be used to reset the module.
- **VDD:** Power supply input. Ensure the voltage does not exceed 3.6VDC to prevent damage.

5. SETUP

To begin using the RYLR896 module, you will need a USB to UART bridge (e.g., REYAX RYLS135) to interface with a computer or a microcontroller with a UART interface.

5.1. Hardware Connection

1. Connect the **GND** pin of the RYLR896 module to the Ground of your UART bridge/microcontroller.
2. Connect the **TXD** pin of the RYLR896 module to the **RXD** pin of your UART bridge/microcontroller.
3. Connect the **RXD** pin of the RYLR896 module to the **TXD** pin of your UART bridge/microcontroller.
4. Connect the **VDD** pin of the RYLR896 module to a stable power supply (e.g., 3.3V).**Warning: Do not exceed 3.6VDC on the VDD or transmit pin to avoid damaging the unit.**
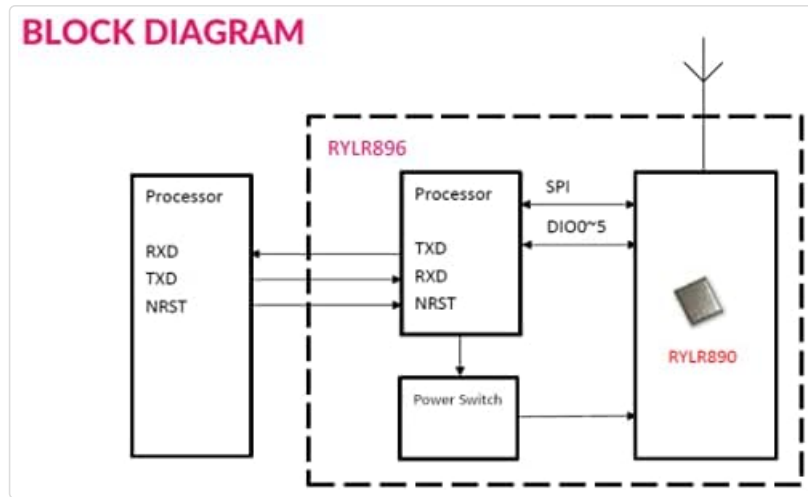5. Ensure the antenna is securely attached or integrated.

BLOCK DIAGRAM

Image: Block diagram illustrating the connection between a processor and the RYLR896 module, highlighting TXD, RXD, and NRST lines.

5.2. Software Configuration

Once connected, open a serial terminal program on your computer. Configure the serial port settings as follows:

- **Baud Rate:** 9600 (default for the module's UART communication)
- **Data Bits:** 8
- **Parity:** None
- **Stop Bits:** 1
- **Flow Control:** None

Ensure your serial terminal is configured to send commands with a Carriage Return (CR) and Line Feed (LF) termination (CRLF) for proper command recognition by the module.

6. OPERATING INSTRUCTIONS (AT COMMANDS)

The RYLR896 module is controlled using a set of AT commands. These commands allow you to configure network parameters, send data, and manage the module's state.

Image: Excerpt from the Lora AT Command Guide, showing basic commands for ADDRESS, NETWORKID, BAND, and PARAMETER.

6.1. Basic AT Commands

- **AT+ADDRESS=<address>**
  Sets the module's unique address. This address identifies the transmitter or specified receiver. Example: AT+ADDRESS=1

- **AT+NETWORKID=<ID>**
  Sets the ID of the Lora network. This is a group function; only modules with the same NETWORKID can communicate. Recommended values: 1-15. Example: AT+NETWORKID=5

- **AT+BAND=<frequency>**
  Sets the center frequency of the wireless band (e.g., 868000000 for 868MHz or 915000000 for 915MHz). Both transmitter and receiver must use the same frequency. Example: AT+BAND=915000000

- **AT+PARAMETER=<SF>,<BW>,<CR>,<Preamble>**
  Sets the RF wireless parameters. Both transmitter and receiver must use the same parameters.
  - **SF (Spreading Factor):** The larger the SF, the better the sensitivity, but transmission time will be longer.
  - **BW (Bandwidth):** The smaller the bandwidth, the better the sensitivity, but transmission time will be longer.
  - **CR (Coding Rate):** Error correction rate.
  - **Preamble:** Preamble length.

  Example: AT+PARAMETER=10,7,1,4

- **AT+SEND=<address>,<length>,<data>**
  Sends data to a specified address. Example:AT+SEND=1,5,HELLO (sends "HELLO" to module with address 1).

For a complete list of AT commands and their detailed usage, refer to the official REYAX documentation.

7. MAINTENANCE

The RYLR896 module is a robust electronic component, but proper handling and care can extend its lifespan and ensure reliable operation.

- **Cleanliness:** Keep the module free from dust, dirt, and moisture. Use a soft, dry cloth for cleaning if necessary.
- **Power Supply:** Always provide a stable and clean power supply within the specified voltage range (VDD max 3.6VDC). Over-voltage can permanently damage the module.
- **Handling:** Avoid static discharge when handling the module. Use anti-static precautions.
- **Storage:** Store the module in a dry, cool environment, away from direct sunlight and extreme temperatures.

8. TROUBLESHOOTING

If you encounter issues with your RYLR896 module, consider the following troubleshooting steps:

- **No Communication:**
  - Verify wiring: Ensure TXD and RXD are crossed correctly (module TXD to host RXD, module RXD to host TXD).
  - Check baud rate: Confirm your serial terminal's baud rate matches the module's default (9600) or configured baud rate.
  - Power supply: Ensure the module is receiving adequate and stable power within the 3.6VDC limit.
  - AT command termination: Commands require CRLF termination. Incorrect termination can lead to unrecognized commands.
- **Inconsistent Responses:** Some users have reported inconsistent End-Of-Line (EOL) termination at very low baud rates (below 1200). Ensure your terminal is configured for CRLF.
- **Module Damage:** Exceeding 3.6VDC on the transmit pin or supply voltage pin can damage the unit. Always double-check your voltage connections.
- **No Range/Poor Performance:**
  - Ensure both modules have the same NETWORKID, BAND, and PARAMETER settings.
  - Check for physical obstructions or interference.
  - Verify antenna connection and integrity.
- **Module Not Responding After Sleep:** If the module is put to sleep, some parameters might need to be re-initialized upon wake-up.

9. REGULATORY INFORMATION

The REYAX RYLR896 module complies with relevant regulatory standards.

Image: FCC Grant of Equipment Authorization document for the RYLR896 module, showing FCC ID QLYRYLR896 and Grantee REYAX TECHNOLOGY CO., LTD.

FCC ID: QLYRYLR896

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 output power listed is conducted. This grant is valid only when the module is sold to OEM integrators and must be installed by the OEM or OEM integrators under the supervision of the Grantee. This transmitter is restricted for use with the specified antenna(s) tested in this application for certification and must not be co-located or operating in conjunction with any other antenna or transmitter within a host device, except in accordance with FCC multi-transmitter product procedures.
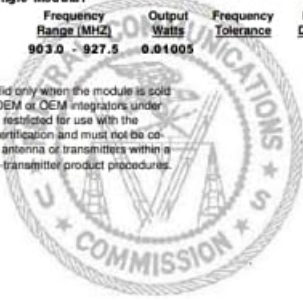
10. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the official REYAX website or contact your point of purchase. Keep your purchase receipt for warranty claims.
You can visit the REYAX Store on Amazon for additional products and information.