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REYAX RYLR993 LoRaWan Transceiver Module User Guide

REYAX

REYAX RYLR993 LoRaWan Transceiver Module

The RYLR993 is a module that can be used for data transmission through the Helium Network, which is a globally distributed network of hotspots that creates public long-range.

What is Helium Network

Helium Network is a globally distributed network of hotspots that creates public long-range.
To check the nearby hotspot, please refer to **https://explorer.helium.com/**.

How to apply Helium Network service

To use Helium network service, you must pay to purchase DC (DATA CREDITS) for data transmission.
Please refer to the website link below for applying for Helium Network service: **https://docs.helium.com/use-the-network/console/quickstart**.
After applying, you can create a Device in the console environment to get Device EUI, App EUI, and App Key. These three data are the
account ID and password used by the RYLR993 module to connect to the Helium Network. You can go through **https://console.helium.com/** to see the information. Usually, it will take a few hours for the sync after you create the Device.

Instruction on how to use RYLR993 and Helium Network for data transmission

The following describes the simple usage process. For advanced usage commands, please refer to the RYLR993 AT Command file.

Boot Information

- The following strings will occur after you Boot or RESET:
- **BAND:** US915
- Stands for the current frequency Band
- +READY
- Set Frequency Band
- After sending AT+BAND=0, RYLR993 will respond as below: BAND:AS923 OK
- Test the response of RYLR993
- After sending AT, RYLR993 will respond as below: OK

Set DEUI

- After sending AT+DEUI=60:81:F9:AF:21:68:5C:5F, RYLR993 will respond as below:

OK

Set APPEUI

- After sending AT+APPEUI=60:81:F9:6B:CA:11:C0:17, RYLR993 will response as below:

OK

Set NWKKEY

- Because Helium Network is an APP itself, therefore the NWKKEY in
- RYLR993 is, after APPKEY send
- AT+NWKKEY=FA:74:AF:C5:95:7A:B7:BF:52:E3:6F:AE:EA:C1:BA:D5:, RYLR993 will respond as below: OK

Log in to Helium Network

- **After sending AT+JOIN=1, RYLR993 will respond as below:** OK +EVT:JOINED `Successfully Login to Helium Network +EVT:RX_1, DR 0, RSSI -19, SNR 8
- The quality of the signal status
- Sending data to Helium Network
- After sending AT+SEND=1:1:31323334, RYLR993 will respond as below:

OK

- +EVT:SEND_CONFIRMED
- Confirmation of sending data successfully
- +EVT:RX_1, DR 2, RSSI -18, SNR 7
- The payload field is the data that has been uploaded successfully, and the format is BASE64

Receive the data transmitted from Helium Network to RYLR993

- As the figure is shown below, 12345678 in Text format can be transferred to RYLR993.

- Due to Helium Network can only download the data when RYLR993 is uploading the data, therefore it is needed to send
- **AT+SEND=1:1:31323334 and RYLR993 will respond as below:** OK +EVT: SEND_CONFIRMED +EVT:1:08:3132333435363738 +EVT: RX_1, DR 2, RSSI -28, SNR 7 Confirmation of sending data successfully

Helium Network can be integrated with another service

- Helium Network can also be integrated with other network protocols and services.
- Contact **sales@reyax.com** or visit **http://reyax.com** for more information.

What is LoRaWAN®

- The LoRaWAN® specification is a Low Power, Wide Area (LPWA) networking protocol designed to wirelessly connect battery-operated 'things' to the Internet in regional, national, or global networks, and targets key Internet of Things (IoT) requirements such as bi-directional communication, end-to-end security, mobility, and localization services. For more details, please refer to **https://lora-alliance.org/**
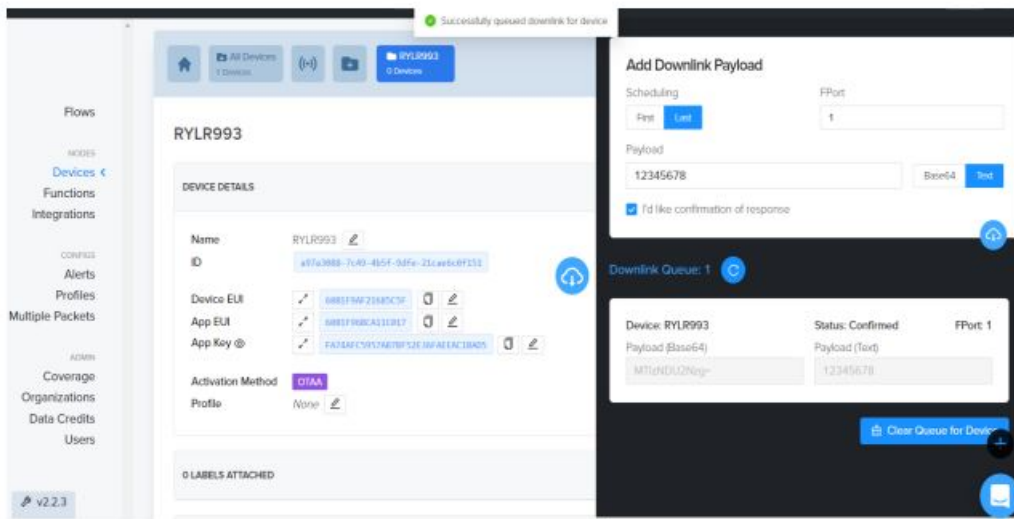
What is Helium Network

- Helium Network is a globally distributed network of hotspots that creates public long-range wireless coverage for LoRaWAN® IoT devices. The helium blockchain network is an open-source public blockchain that creates a decentralized wireless network. For more details, please refer to **https://www.helium.com/**

To Check the hotspot nearby, please refer to https://explorer.helium.com/

How to apply Helium Network service

- To use Helium network service, you must pay to purchase DC (DATA CREDITS) for data transmission. Please refer to the website link below for applying Helium Network service.
- **https://docs.helium.com/use-the-network/console/quickstart**
- After applying, you can create a Device in the console environment to get "Device EUI", "App EUI" and "App Key".
- These three data are the account ID and password used by the RYLR993 module to connect to the Helium Network.
- You can go through **https://console.helium.com/** to see the information. Usually, it will take a few hours for the sync after you create the Device

Instruction on how to use RYLR993 and Helium Network for data transmission

- The following describes the simple usage process. For advanced usage commands, please refer to the RYLR993 AT Command file.
- **Boot Information:** The following strings will have occurred after you Boot or RESET: BAND: US915 'Stands for the current frequency Band +READY
- **Frequency Band** : After sending "AT+BAND=0", RYLR993 will response as below BAND:AS923 OK
- Test the response of RYLR993 : After sending "AT", RYLR993 will response as below OK
- **Set DEUI**: After sending "AT+DEUI=60:81:F9:AF:21:68:5C:5F", RYLR993 will respond as below OK
- **Set APPEUI:** After sending "AT+APPEUI=60:81:F9:6B: CA:11:C0:17", RYLR993 will respond as below. OK
- **Set NWKKEY**: Because Helium Network is an APP itself, therefore the NWKKEY in RYLR993 is, after APPKEY send "AT+NWKKEY=FA:74:AF:C5:95:7A:B7:BF:52:E3:6F:AE:EA:C1:BA:D5:", RYLR993 will response as below OK
- **Log in to Helium Network:** After sending "AT+JOIN=1", RYLR993 will respond as below OK
- **EVT:** JOINED 'Successfully log in to Helium Network
- **EVT:** RX_1, DR 0, RSSI -19, SNR 8 'The quality of the signal status
- **Sending data to Helium Network:** After sending "AT+SEND=1:1:31323334", RYLR993 will respond as below OK
- **+EVT:** SEND_CONFIRMED 'Confirmation of sending data successfully
- **+EVT:RX_1,** DR 2, RSSI -18, SNR 7
- The payload field is the data that has been uploaded successfully, and the format is BASE64

- **Receive the data transmitted from Helium Network to RYLR993:** As the figure is shown below, 12345678 in Text format can be transferred to RYLR993
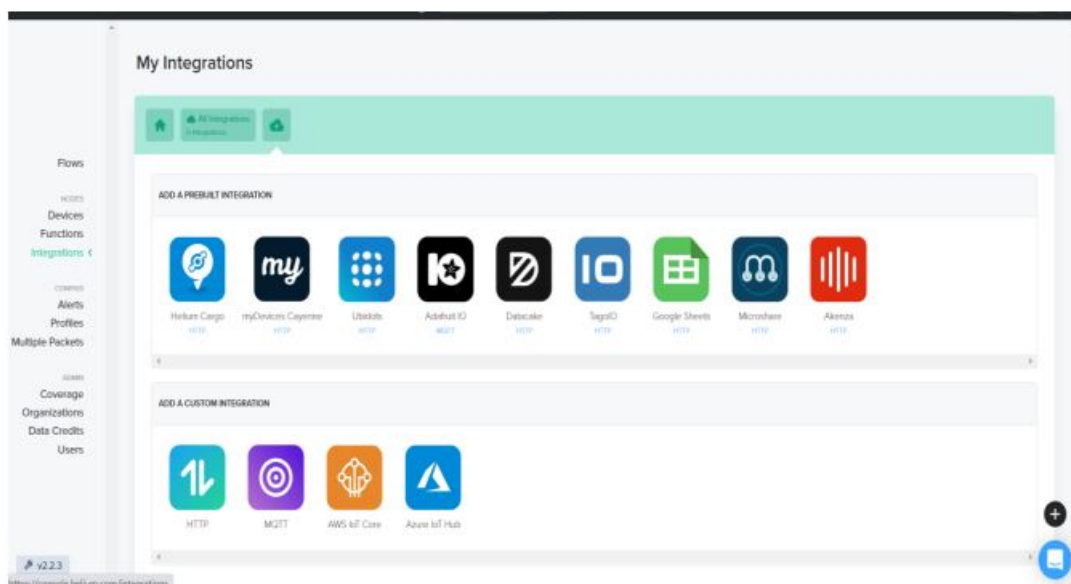
- Due to Helium Network can only download the data when RYLR993 is uploading the data, therefore it is needed to send "AT+SEND=1:1:31323334:", and RYLR993 will respond as below

OK

- **+EVT:SEND_CONFIRMED**
- **+EVT:1:08:3132333435363738** 'Confirmation of sending data successfully
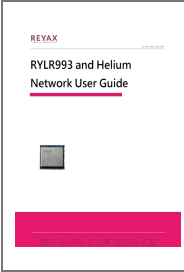- **+EVT:RX_1,** DR 2, RSSI -28, SNR 7

Helium Network can be integrated with other services

Helium Network can also be integrated with other network protocols and services.

- **sales@reyax.com**
- **http://reyax.com**
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Documents / Resources

References

- **REYAX: IoT Solution Provider Modules, Wireless Solution   IoT Connectivity**
- **REYAX: IoT Solution Provider Modules, Wireless Solution   IoT Connectivity**
- **Helium Console**
- **Quickstart | Helium Documentation**
- **Helium Hotspots Map**
- **Homepage - LoRa Alliance®**
- **Helium – Introducing The People's Network**

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