

CONFIGURE LORA

I. HARDWARE

- E32-TTL-100 SX1278 LoRa module have 2 pin M0 and M1. Used to set the modes of the module. There are 4 modes: **normal**, **wake-up**, **power-saving**, **sleep**

Mode	M1	M0	Explanations
Normal	0	0	UART and wireless channel is good to go
Wake-up	0	1	Same as normal but a preamble code is added to transmitted data for waking-up the receiver
Power-saving	1	0	UART is disable and wireless is on WOR (Wake On Radio) mode which means the device will turn on when there is data to be received. Transmission is not allowed
Sleep	1	1	Used in setting parameters. Transmitting and receiving disabled

- When you want to configure LoRa, you set 2 pins M0 and M1 to **High Level**. Otherwise, you set 2 pins M0 and M1 to **Low Level** when normal mode activity
- Use TTL-USB connect to LoRa to configure

LoRa		TTL-USB
GND	<=>	GND
Vcc	<=>	3V3
AUX	<=>	reserve
TXD	<=>	RXD
RXD	<=>	TXD
M0	<=>	3V3
M1	<=>	3V3

II. SOFTWARE

- There is 2 method for parameter settings to LoRa
 - Send **Hexadecimal Command** for LoRa via CoolTerm software, Hercules software, etc
 - Using **RF_Setting3.47 Software** wrote by EBYTE firm

A. Use Hexadecimal Command

- When the module is in sleep mode (M0 = 1, M1 = 1), you can change some options like **Baud rate**, **UART format**, etc.
- *Syntax*

0xC0/0xC2 ADDH ADDL SPED CHAN OPTION

- Notes: when you want the parameter to be **saved to EPPROM**, use **0xC0**.
Otherwise, use **0xC2**

Item	Description	Note
ADDH	Module high address byte (00H by default)	
ADDL	Module low address byte (00H by default)	
SPED	UART Baud Rate and Air Data Rate	See bit descriptions below
CHAN	Operating Frequency (00H to FFH corresponding to 410 to 411 MHz. Default is 17H - 433MHz)	
OPTION	Other options	See bit descriptions below

- SPED Bit Descriptions

Bit 7,6 - UART Parity	Bit 5,4,3 - UART Baud Rate	Bit 2,1,0 - Air Data Rate
00: 8N1 (default)	000: 1200bps	000: 0.3kbps
01: 8O1	001: 2400bps	001: 1.2kbps
10: 8E1	010: 4800bps	010: 2.4kbps (default)
11: 8N1 (equal to 00)	011: 9600bps (default)	011: 4.8kbps
	100: 19200bps	100: 9.6kbps
	101: 38400bps	101: 19.2kbps
	110: 57600bps	110: 19.2kbps (equal to 101)
	111: 115200bps	111: 19.2kbps (equal to 101)

- OPTION Bit Description

Bit 7 - Fixed Transmission	Bit 6 - I/O Drive Mode	Bit 5,4,3 - Wireless Wake-up Time	Bit 2 - Forward Error Correction (FEC) Swicth	Bit 1,0 - Transmission power
0: Transparent transmission (default)	0: TXD, RXD, AUX are open-collectors (open drain)	000: 250ms (default)	0: Turn off FEC	00: 20dBm (default)
1: Fixed transmission (first three bytes can be used as high/low address and channel)	1: TXD, RXD, AUX are push-pulls/pull-ups	001: 500ms	1: Turn on FEC (default)	01: 17dBm
		010: 750ms		10: 14dBm
		011: 1000ms		11: 10dBm
		100: 1250ms		
		101: 1500ms		
		110: 1750ms		
		111: 2000ms		

- Example for Hexadecimal Commands
 - You want to change the UART baud rate to 115200bps, parity to 8N1, air data rate to 19.2Kbps, use the default 433MHz operating frequency, enable Fixed transmission modec, choose Push-pull pins, wake-up time to 250ms, FEC enable, transmission power to 20dBm. Send the commands

```
0xC0 0x00 0x00 0x3D 0x17 0xC4
```

- For reading the current options, send the commands

```
0xC1 0xC1 0xC1
```

- For reading the version number

0xC3 0xC3 0xC3

- Resetting the module

0xC4 0xC4 0xC4

B. Use RF_Setting3.47 Software

○ STEP1: Open tool RF_Setting3.47 software

- Go to link PC/Laptop ... \m.e.s-iiot\4.LoRaWAN Configure then click RF_Setting3.47.exe application to run

Name	Date modified	Type	Size
datasheet	11/24/2017 10:51 PM	File folder	
RF_Setting3.47	3/13/2018 12:55 PM	Application	244 KB
README	10/27/2022 10:57 AM	MD File	1 KB

○ STEP2: Setting

- Choose language: English language or Chinese language



- Choose COM Port then click to OpenPort for connect to LoRa



- After successfully connect to LoRa, click to **GetParam** for getting previous parameter setting then click to **OK** in notification messenger



- Parameter setting
 - FRAME 1:
 - Settings **Address**, the each device will set up the each different address
 - Settings **Channel**, you can keep parameter if you develop the LoRaWAN network
 - FRAME 2:
 - UartRate: **9600bps** or **115200bps** standard. You can set up the different options
 - Parity: **8N1** by default. You can set up the different options
 - AirRate: **19.2Kbps** (option user). Default as **2.4Kbps**

- Power: **20dBm** by default. You can set up the different options
- FEC: **Enable** (option user). Default as **Disable**
- Fixed mode: **Enable** (option user). Default as **Disable**
- WOR timing: **250ms** by default. You can set up the different options
- IO mode: **PushPull** by default. You can set up the different options

RF Setting V3.47

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Chengdu Ebyte Electronic Technology Co.,Ltd.

中文
English

ID: E32
Version: 5.3
Freq Now: 411.0MHz
Param Now: 0x1, 0x1, 0x3d, 0x1, 0xc4

COM4 ClosePort Models
GetParam SetParam Preset

UartRate 115200bp Parity 8N1 AirRate 19.2Kbps Power 20dBm
FEC Enable Fixed mode Enable WOR timing 250ms IO mode PushPull

Address 101
Channel 1

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STEP3: Upload parameter

- After prepared parameters, click to **SetParam** for setting to LoRa then click **OK** in notification messenger

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中文
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ID: E32
Version: 5.3
Freq Now: 411.0MHz
Param Now: 0x1, 0x1, 0x3d, 0x1, 0xc4

COM4 ClosePort Models
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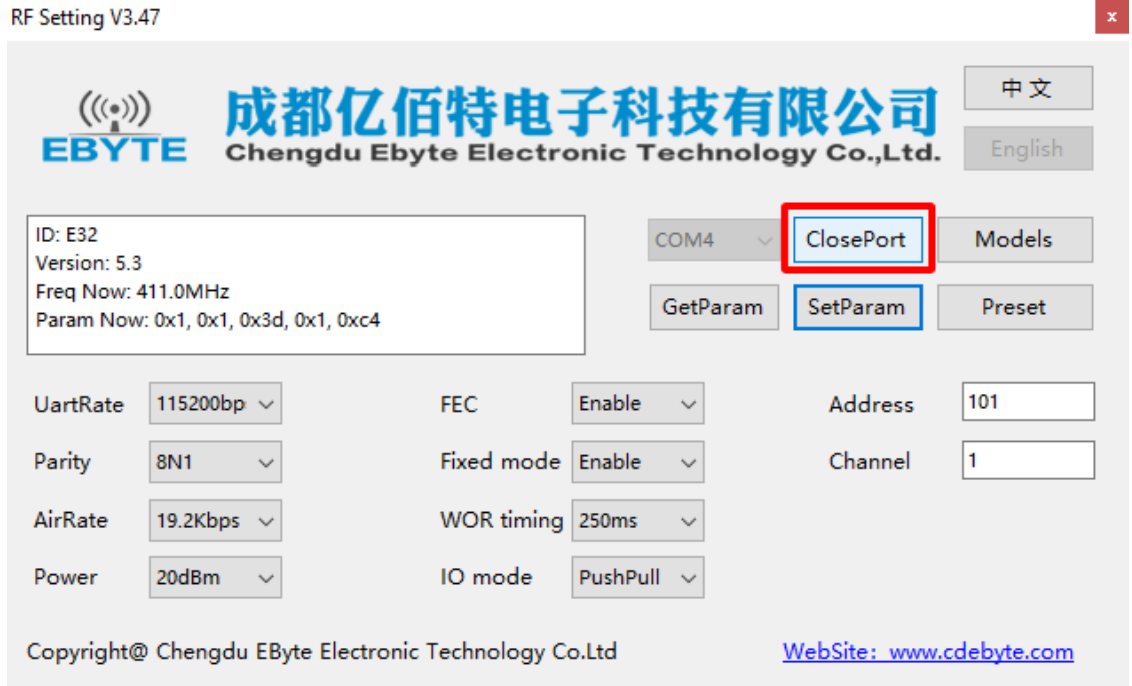
UartRate 115200bp Parity 8N1 AirRate 19.2Kbps Power 20dBm
FEC Enable Fixed mode Enable WOR timing 250ms IO mode PushPull

Address 101
Channel 1

Param has been set
OK

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- Disconnect to LoRa with software, click to **ClosePort**



III. OPERATION

- You should change 2 pins **M0** and **M1** to **Low Level** when normal mode activity
- When you transmit data from A-LoRa to B-LoRa with the same channel in the LoRaWAN network, send the commands (Hexadecimal format)

ADDH ADDL CHAN DATA

Notes:

- ADDH: Address high byte of LoRa receiver
- ADDL: Address low byte of LoRa receiver
- CHAN: Channel of LoRa receiver
- DATA: Data from LoRa transmit to LoRa receiver

- Example: A LoRa is address **0x0101** send data to B LoRa is address **0x0202** with the same channel **0x01** and otherwise

- A-LoRa (0x0101) transmit:

0x02 0x02 0x01 0xAA 0xBB 0xCC

- B-LoRa (0x0201) receiver:

0xAA 0xBB 0xCC

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