

LoRa Module Operating Modes

There are four operating modes, which are set by M1 and M0, the details are as follows:

| Mode(0-3) | M1 | M0 | Description | Remark |
|----------------------|----|----|--|---|
| 0 Normal Mode | 0 | 0 | UART and wireless channel are open, transparent transmission is on | Supports configuration over air via special command |
| 1 WOR Mode | 0 | 1 | Can be defined as WOR transmitter and WOR receiver | Supports wake up over air |
| 2 Configuration Mode | 1 | 0 | Users can access the register through the serial port to control the working state of the module | |
| 3 Deep sleep Mode | 1 | 1 | Sleep mode | |

Mode Switching:

| No. | Remark |
|-----|---|
| 1 | <ul style="list-style-type: none">● Users can combine M1 and M0 with high and low levels to determine the operating mode. Two GPIOs of the MCU can be used to control mode switching;● After changing M1 and M0: If the module is idle, after 1ms, it can start working according to the new mode;● If the serial port data of the module has not been transmitted through the wireless, the new working mode can be switched after the transmission is completed;● If the module receives the wireless data and transmits the data through the serial port, it needs to finish transmission before switching the new working mode;● Therefore, mode switching can only be valid when AUX output is 1, otherwise it will delay switching. |
| 2 | <ul style="list-style-type: none">● For example, users continuously inputs a large amount of data and simultaneously performs mode switching. At this time, the switching mode operation is invalid; the module will process all the user data before performing the new mode detection;● Therefore, the general recommendation is to detect the output state of the AUX pin and switch after 2ms when the output is high. |
| 3 | <ul style="list-style-type: none">● When the module is switched from other modes to sleep mode, if the data has not been processed yet;● The module will process these data (including receiving and sending) before entering sleep mode. This feature can be used for fast sleep, which saves power; for example, the transmitter module works in mode 0, the user transmits the serial port data "12345", and then does not have to wait for the AUX pin to be idle (high level), and can directly switch to sleep mode. And the user's main MCU immediately sleeps, the module will automatically transmit the user data through the wireless, and automatically enters sleep within 1ms;● This saves MCU's working time and reduces power consumption. |
| 4 | <ul style="list-style-type: none">● Similarly, any mode switching can use this feature. After the module processes the current mode event, it will automatically enter the new mode within 1ms; thus eliminating the need for the user to query AUX and achieve the purpose of fast switching;● For example, switching from the transmit mode to the receive mode; the user MCU can also enter sleep before the mode switch, and use the external interrupt function to acquire the AUX change, thereby performing mode switching. |
| 5 | <ul style="list-style-type: none">● This operation mode is very flexible and efficient, and is designed according to the user's MCU's operation convenience, and can reduce the workload of the entire system as much as possible, improve system efficiency, and reduce power consumption. |

Normal Mode (Mode 0)

| Type | M0 = 0, M1 = 0 |
|--------------|--|
| Transmitting | Users can input data through the serial port and the module will start wireless transmission. |
| Receiving | The module wireless receiving function is turned on, and after receiving the wireless data, it will be output through the serial port TXD pin. |

WOR Mode (Mode 1)

| Type | M0 = 1, M1 = 0 |
|--------------|--|
| Transmitting | When defined as a transmitting party, a preamble is automatically added before transmitting. |
| Receiving | It can receive data normally, the receiving function is the same as mode 0. |

Configuration Mode (Mode 2)

| Type | M0 = 0, M1 = 1 |
|---------------|---|
| Transmitting | Wireless transmitting off |
| Receiving | Wireless receiving off |
| Configuration | Users can access the registers to configure the module's operation state. |

Deep Sleep Mode (Mode 3)

| Type | M0 = 1, M1 = 1 |
|--------------|--|
| Transmitting | Unable to transmit wireless data |
| Receiving | Unable to receive wireless data |
| Note | When from the sleep mode to other modes, the module will reconfigure the parameters. During the configuration process, AUX will remain low; After configuration, it outputs high level, we suggest that user test rising edge AUX. |