E180-Z5812SX

TLSR8258 2.4GHz ZigBee 3.0 Multifunctional SoC RF Module



Chengdu Ebyte Electronic Technology Co.,Ltd.

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1 Introduction

1.1 Product Introduction



E180-Z5812SX is a ZIGBEE module designed and produced by Chengdu Ebyte based on the TELINK TLSR8258 wireless SOC. It has a small size, low power consumption, high reliability, and works in the 2.4GHz frequency band. The chip comes with a 32-bit high-performance MCU up to 48Mhz. The maximum transmit power can reach 12dBm, and its lowest period sleep current is 2uA.

TLSR8258 is a wireless microcontroller with great potential to become the first choice for future smart furniture, IoT transformation, and industrial automation. Its network characteristics comply with the ZIGBEE 3.0 standard and provide a complete application integration solution based on the IEEE802.15.4 standard ISM frequency band. The product has been tested and certified by a series of authoritative radio frequency instruments, combined with years of market experience and the actual needs of users in the industry, integrates the extremely complex communication protocol of wireless products into the built-in SoC, supports serial transparent transmission mode, and integrates quickly and easily The self-organizing network function used provides multi-channel configurable ADC, IO, and PWM interfaces, which can simplify the complicated development process of wireless products and make your products quickly put into the market at a lower cost.

1.2 Features

- Centralized network management: ZIGBEE 3.0 security standard centralized network access mechanism, data security and reliability;
- Large capacity: 512K capacity flash, 64K capacity RAM, network nodes can be expanded to more than 100;
- Role switching: The user can switch the device between two types of terminal and dormant terminal arbitrarily through serial port commands;
- Support multiple network topologies: point-to-point, star network, MESH network;
- Network self-healing: If the intermediate node of the network is lost, other networks will automatically join or maintain the original network;
- Address search: Users can find the corresponding short address according to the MAC address of the node that has been added to the network, and at the same time find the corresponding long address of each node in the network according to the short address of the node.
- Data security: Integrated ZIGBEE 3.0 security communication standard, the network contains multi-level security keys;
- Serial port configuration: The module has built-in serial port commands, and users can configure (check) the parameters and functions of the module through the serial port commands.
- Network PAN_ID change: Any switch of network PAN_ID, users can customize PAN_ID to join the corresponding network or automatically select PAN_ID to join the network;
- GPIO control: local/remote GPIO level control, 2 IOs can be selected;
- PWM control: local/remote PWM control, 4 PWM channels for users to choose;
- ADC control: local/remote ADC reading, 3 ADC channels for users to choose (including power supply voltage detection);
- One key to restore the baud rate: If the user forgets or does not know the baud rate, this function can be used to restore the

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default baud rate to 115200.

- Serial port receive wakeup: support the serial port receive wakeup function, when the module is in sleep state when it receives a frame of less than or equal to 10 bytes of data, it will be awakened. This data is a wake-up frame used to wake up the module and will not be treated as data .
- Module reset: The user can reset the module through the serial port command.
- Restore factory settings: the user can restore the factory settings of the module through serial commands
- Over-the-air configuration: users can use over-the-air configuration commands to remotely configure other devices in the network

1.3 Device Types

There are four types of logical devices in the ZigBee network: Coordinator, Router, End-Device (non-sleeping terminal) and Sleep-End-Device (sleeping terminal). The ZigBee network consists of a Coordinator, multiple Routers, and multiple End_Devices (the terminal nodes can be divided into dormant terminals and non-dormant terminals). This product only supports End-Device (non-sleeping terminal) and Sleep- End-Device (sleeping terminal) two device types, Coordinator (coordinator) and Router (router) two types use our E180-Z8910SX/P products .

1.3.1 Non-sleeping terminal

The main task of non-sleeping terminal equipment is to send and receive messages, and other nodes are not allowed to connect with the terminal equipment. The non-sleeping terminal is always in the working state and can receive and send data at any time.

1.3.2 Sleeping terminal

The dormant terminal enters a dormant state when there is no data transmission and reception, and the dormant current is as low as about 2uA.

When you need to send wireless data or perform command operations, you need to send a wake-up frame through the serial port. The length needs to be 5 bytes (it is recommended to use "FF FF FF FF FF" to wake up with 5 bytes of "FF"). Time, the serial port data (configuration commands, payload) can be processed during the period. When a frame of serial port data is successfully received, the wake-up timeout counter will be refreshed, and the wake-up duration will go back by Uart_holdtime, otherwise the device will go to sleep again. Uart_holdtime defaults to 1000ms and supports HEX command to change its value.

Sleep terminal wake-up can also be awakened through the function pin WAKE. WAKE defaults to high level. Pull down the WAKE pin and the module continues to wake up. Release the WAKE pin to restore the default high level and the module resumes sleep.

When data needs to be received, data is received through periodic wake-up. The longer the wake-up period is set, the longer the reception will be. The wake-up period must be less than 30 seconds. If you only need to upload data, you can set the wake-up period to be greater than 30 seconds or longer to reduce power consumption (the default is 10 seconds) such as battery-powered sensors.

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1.4 Applications:

- Smart home and industrial sensors, etc.;
- Security system, positioning system;
- Wireless remote control, UAV;
- Wireless game remote control;
- Medical and healthcare products;
- Wireless voice, wireless headset;
- Advanced meter reading architecture (AMI);
- Application in the automotive industry;
- Building automation solutions;
- Agricultural greenhouse automation application;

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2 Parameters

2.1 Limit Parameters

Parameters	Value		Notes
	Min.	Max.	
Power supply voltage (V)	1.9	3.6	Over 3.6V will permanently burn the module
Blocking power (dBm)	-	10	It is less likely to burn when used at close range
Working temperature (℃)	-40	+85	Industrial grade

2.2 Working Parameters

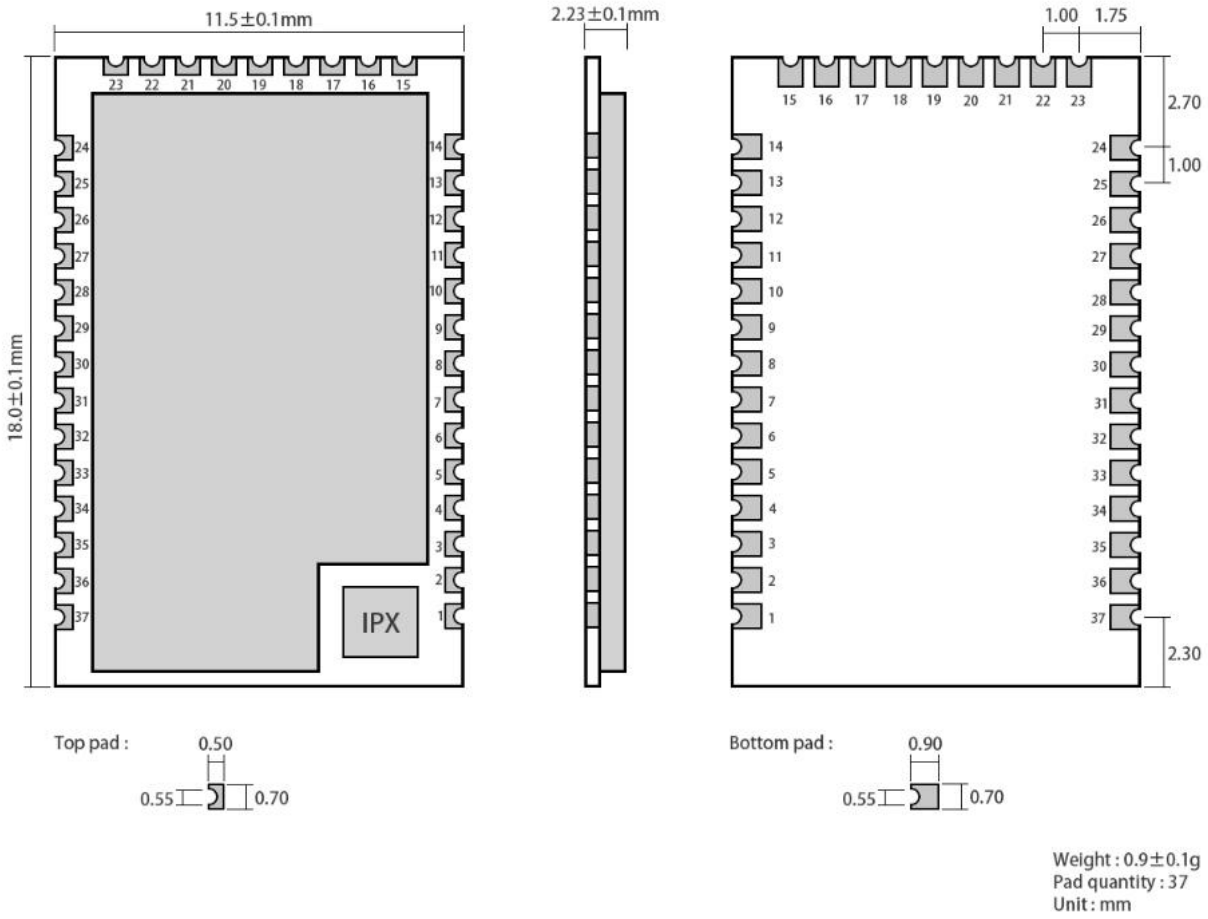
Parameters		Value			Notes
		Min.	Typical	Max.	
Working voltage (V)		1.9	3.3	3.6	≥3.3V can guarantee output power
Communication level (V)			3.3		Using 5V TTL is risky to burn
Working temperature (℃)		-40	-	+85	Industrial design
Working frequency (MHz)		2405	-	2480	Support ISM frequency band
Power	Emission current(mA)		24		Max Current is 24mA at 12dbm
	Receiving current(mA)		9		
	Sleep current (μA)		2.5		Periodic sleep current averages 2.5uA
Maximum transmit power(dBm)			12		
Air rate (bps)			250k		

The main parameters	Value	Notes
Ideal communication distance	500m	Two module in a sight of line, the test antenna is 5dbi antenna at 5meters. (Zigbee network supports routing multi-hop function, which can extend the transmission distance by adding routers)
weight	0.9g	
supporting agreement	Zigbee 3.0	
Module Type	SMD	
Interface method	1.27mm	Stamp Hole
IC full name	TLSR8258F512ET32	
FLASH	512KB	
RAM	64KB	
Kernel	32 位 MCU	
Dimensions	11.5*18mm	
Antenna interface	IPEX	Equivalent impedance is about 50Ω

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3 Dimensions and Pins



Pin No.	Pin Name	Input/output	Functions
1	NC	-	Reserved, directly suspended
2	GND	-	Ground wire, connected to the power reference ground
3	NC	-	Reserved, directly suspended
4	PD3(WAKE)	Input	The WAKE pin is mainly used to wake up the dormant terminal. It is high when it is powered on. When the pin is pulled low externally, the dormant terminal device will be awakened.
5	PD7(TX)	Output	Serial transmission port TX
6	PA0(RX)	Input	Serial receiving port RX
7	NC	-	Reserved, directly suspended
8	NC	-	Reserved, directly suspended
9	PD4(MODE)	Input	Working mode switching pin, when the pull-down time is greater than 500ms, the working mode is switched.
10	PA1(BAUD_R)	Input	The UART_BAUD_RESET pin is used to reset the baud rate of the device. It defaults to a high level after power-on. In any mode, the module serial port parameters will be restored to the default 115200 if the pin is pulled down for more than 1000ms.

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11	PB1(ACK)	Output	The ACK pin is used to indicate the status of the last user data transmission. The pin is pulled low before the transmission is started, and the pin is pulled high after the transmission is successful.
12	PC0(GPIO0)	Input/output	GPIO input/output port 0
13	VCC	-	Module power supply positive reference voltage, voltage range
14	GND	-	Ground wire, connected to the power reference ground
15	PB4(GPIO1)	Input/output	GPIO input/output port 1
16	NC	-	Reserved, directly suspended
17	NC	-	Reserved, directly suspended
18	PB5(AUX)	Output	The AUX pin indicates the current working status of the device. When the pin is low, it indicates that the device is busy, and the high level indicates that the device is idle.
19	NC	-	Reserved, directly suspended
20	NC	-	Reserved, directly suspended
21	PB6(ADC1)	Input	ADC detection port 1
22	PB7(ADC2)	Input	ADC detection port 2
23	NC	-	Reserved, directly suspended
24	NC	-	Reserved, directly suspended
25	SWCLK	Input/Output	Serial debug interface, serial line clock
26	SWDIO	Input/Output	Serial debugging interface, serial data input and output
27	PC2(PWM0)	Output	PWM output port 0
28	PC3(PWM2)	Output	PWM output port 2
29	PC4(PWM3)	Output	PWM output port 3
30	PC1(LINK)	Output	The LINK pin indicates the current network status of the module, and the output high-level meter has been added to the network
31	NC	-	Reserved, directly suspended
32	PD2(PWM1)	Output	PWM output port 1
33	NC	-	Reserved, directly suspended
34	NC	-	Reserved, directly suspended
35	NC	-	Reserved, directly suspended
36	GND	Input/output	Ground wire, connected to the power reference ground
37	nRESET	Input	Reset pin

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4 Working Mode

4.1 Transmission Mode

When the module enters the transmission mode, any data received by the serial port will be sent out wirelessly. The transmission mode is wireless communication between network nodes. The communication methods include unicast, protocol unicast, multicast, protocol multicast, and broadcast. Wait.

4.2 Configuration Mode

When the module enters the configuration mode, the data received by the serial port defaults to the configuration command to configure and operate the device. In the configuration mode, the data received by the serial port of the module is regarded as a HEX command.

4.3 Switching of Working Mode

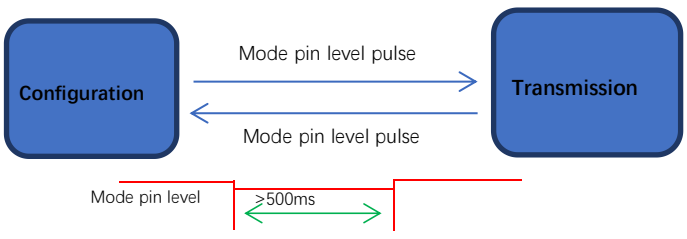
4.3.1 Commands for Working Mode

The module power-on initialization defaults to the transmission mode.

In the transmission mode, when the module serial port receives the "2A 2D 2E" character, it will enter the configuration mode. After entering the configuration mode, it will return the "7A 7D 7E" character. In the configuration mode, when the module serial port receives the "2F 2C 2B" character, the module exits the configuration mode and enters the transmission mode. After entering the transmission mode, it returns the "7F 7C 7B" character.

4.3.2 Change of Pins

Working mode switch pin PD4, internal configuration pull-up resistor input mode, power-on default high level, in any mode when the mode switch pin PD4 is pulled down for more than 500ms, the module work mode switch, as shown in the figure below Show:



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5 Modes of Transmission

5.1 Modes of Sending Data

The data transmission mode of the module includes 5 modes: unicast, protocol unicast, multicast, protocol multicast, and broadcast.

5.1.1 Broadcasting Mode

In broadcast mode, the sending device sends the data received by the serial port to every node in the network, and all devices in the network will receive the data.

5.1.2 Multicast Mode

In the multicast mode, first set the group number of the devices in the network in the configuration mode (grouping, restart to take effect), and the sending device specifies the target group number to send in the configuration mode (which group to send the data to), and then The sending device enters the transmission mode and sends the data received by the serial port to the network, and the device with the same group number in the network will receive the data.

5.1.3 Protocol multicast mode

When the sending device is in transmission mode, the serial port receives data, the first byte represents the target group number, and the following data represents valid wireless transmission data. There is no need to enter the configuration mode to configure the target group number.

5.1.4 Unicast Mode

In unicast mode, the devices in the network conduct point-to-point communication through the network address. The sending device sends the received serial port data to the target address device, and the target address device can return an ACK to the sending device after receiving the data. Data (the dormant terminal node has no ACK function).

5.1.5 Protocol unicast mode

When the sending device is in transmission mode, the serial port receives data. The first two bytes represent the short address of the target network, and the following data represents valid wireless transmission data. There is no need to enter the configuration mode to configure the short address of the target network.

Note: When configured as broadcast or multicast, the period of periodic transmission is recommended to be greater than 2000ms,

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otherwise it may cause data congestion.

5.2 Modes of Receiving Data

The received data output mode refers to the way in which the serial port outputs data after the module receives wireless data.

5.2.1 Transparent Output

If the output mode of the configuration device is transparent output, the module will output the original data through the serial port after receiving the wireless data.

5.2.2 Data + Short Address

When the output mode of the device is data + short address, after the module receives the wireless data, the serial port will output the original data + the short address of the sending device.

5.2.3 Data + Long Address

When the output mode of the device is data + long address, after the module receives wireless data, the serial port will output the original data + the long address of the sending device;

Note: The terminal device can resolve the long address of the sending device such as coordinator, router and terminal, but the coordinator and router cannot resolve the long address of the terminal sending device

The coordinator and router here are E180-Z8910SX/P products.

5.2.4 Data+RSSI

When the output mode of the device is data + RSSI, after the module receives the wireless data, the serial port will output the original data + the RSSI value of the received data packet.

5.2.5 Data + Short Address+RSSI

When the output mode of the device is data + short address + RSSI, after the module receives the wireless data, the serial port will output the original data + the short address of the sending device + the RSSI value of the received data packet.

5.2.6 Data + Long Address+RSSI

When the output mode of the device is data + long address + RSSI, after the module receives the wireless data, the serial port will output the original data + the long address of the sending device + the RSSI value of the

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received data packet.

Note: The terminal device can resolve the long address of the sending device such as coordinator, router and terminal, but the coordinator and router cannot resolve the long address of the terminal sending device
The coordinator and router here are E180-Z8910SX/P products.

Note: The sender supports a single packet with a maximum data packet length of 72 bytes.

6 Function Pins and Command Configuration

6.1 Function Pins

6.1.1 LINK Details

The LINK pin indicates the current network status of the module. After the device is successfully connected to the network, the current pin is pulled high. When the device has no network or the parent node is lost, this pin is pulled low. The external device can query the device network status through the pin level.

6.1.2 WAKE Details

The WAKE pin is mainly used to wake up the dormant terminal. It defaults to a high level when it is powered on. When the pin is pulled low externally, the dormant terminal device will continue to be awakened. When the pin is released externally, it returns to high level and enters sleep. ; Sleep time is determined by the duration of the external pull down of this pin; for non-sleeping devices, this pin is meaningless.

6.1.3 AUX Details

The AUX pin indicates the current working status of the device. When the pin is low, it indicates that the device is busy. The high level indicates that the device is idle. When the device receives data, the module will pull the AUX pin low for AUX_delaytime, and the serial port will start outputting. Data, used to wake up the external control device, AUX_delaytime defaults to 4ms, which can be changed by the serial port command and the customer decides according to the wake-up time of the main chip.

6.1.4 ACK Details

The ACK pin is used to indicate the status of the last user data transmission. The pin is pulled low before the transmission is started, and the pin is pulled high after the transmission is successful. The user can judge whether the data has arrived successfully through the pin state. This pin function cannot instruct the coordinator to send a broadcast message. (Only applies to non-sleeping terminals).

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6.1.5 UART_BAUD_RESET Details

The UART BAUD RESET pin is used to reset the baud rate of the device. It defaults to a high level after power-on. In any mode, the module serial port parameters will be restored to the default 115200 and 8N1 if the pin is pulled down for more than 1000ms.

Pins	Interface
LINK	PC1
WAKE	PD3
AUX	PB5
ACK	PB1
UART_BAUD_RESET	PA1

6.2 Wireless remote configuration function

The module supports the remote configuration function, which is identified by the two-byte wireless configuration ID by default as A8 8A. The user can modify the remote configuration ID of the module. When the module receives the first two bytes of wireless air data as the wireless configuration ID, The module judges that the data packet is a remote configuration command and executes the operation corresponding to the command. The data packet will not be output through the serial port. The remote configuration of the dormant terminal needs to wake up first.

6.3 Function Parameter Description

The module provides a wealth of configurable parameters, which can be used flexibly according to actual application requirements to construct different forms of networks.

Configuration	Type	Code Range	Functions
PANID	Read/ write	0x0000～ 0xFFFF	PANID is the network identifier of ZIGBEE, used to determine the identity of the network to which it belongs. The PANID of all devices in the same network must be the same. When the terminal or router is configured as 0xFFFF, it can join any network where the same channel already exists.
Local network address	read	0x0000～ 0xFFFF	Used to distinguish each node in the network. Each device is in the same network. The local network address must be unique. When not joining the network, the network address of the device is 0xFFFF. After joining, the device short address is assigned by the coordinator. The coordinator is fixed as: 0x0000.
network status	read	0、2、3	Indicates the network status of the current device, including no network, has successfully joined the network, and there is no parent node.
Destination network address	Read/ write	0x0000～ 0xFFFF	The current device communication destination (short address) can be switched at any time through configuration commands.
Local MAC	read	64bitMAC	The MAC address assigned by the network of this module cannot be

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address			changed by the user (re-entry to the network)
Destination MAC address	Read/ write	64bitMAC	In fixed-point mode, use long address to send
Equipment type	Read/ write	E、S	They are: non-sleeping terminal, dormant terminal.
channel	Read/ write	CH11～26	The physical channel where ZIGBEE works.
Send mode	Read/ write	0、1、2、3、4、5	The transmission modes of the configuration module are: broadcast mode, multicast mode, short address on demand mode, long address on demand mode, protocol on demand, and protocol multicast. For details, please see the corresponding mode function introduction.
Output mode	Read/ write	0、1、2、3、4、5	Configure the data output mode of the module, respectively:
Transmit power	Read/ write	-37dbm～7dbm	Penetrate.
Remote configuration ID	Read/ write	2 bytes	Data + short address.
Local network group number	Read/ write	1～254	Data + long address.
Target network group number	Read/ write	1～254	Data + RSSI;
Wake-up period (sleep time)	Read/ write	0～2010 seconds	Data + short address + RSSI.
Lost parent node reconnection period	Read/ write	1～254 minutes	Data + long address + RSSI.
Maximum number of reconnections	Read/ write	1～254 times	The output power of the module has high requirements for power consumption. When the distance is not required, the transmission power can be reduced to save average power consumption.
IO status	Read/ write	High/low	Used to determine whether the data received over the air is a remote configuration command. Customers can change the unlimited configuration ID according to their needs. The default is A8 8A.
PWM	Read/ write	1us～340ms	Used to configure the group number of the device in the network.
ADC value	read	0～3300mv	It is used to configure the group number of the corresponding target when the device is multicast.

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6.5 HEX AT Command

6.5.1 Command Format

Local serial port reading format:
Network parameter reading FE LEN CMD FF
Peripheral parameter reading FE LEN CMD CHANNEL FF
FE: fixed head
LEN: Actual length of DATA
CMD: Actual named ID
CHANNEL: Channel selection when reading PWM, ADC, GPIO
FF: end of command
Reading return format: FB CMD DATA
FB: fixed head
CMD: Command ID
DATA: parameter
Local serial port configuration format: FD LEN CMD DATA FF
FD: fixed head
LEN: the actual length of DATA
CMD: Actual named ID
DATA: actual parameters
FF: end of command
Configuration return: FA CMD
FA: fixed head
CMD: Command ID
Return when read/configure access: F7 FF does not exist the information/read/configure/format failed

Wireless remote reading/configuration format: add wireless configuration ID before the command format of the local serial port

The default is A8 8A (the value can be modified), for example:
The configuration format is A8 8A FD LEN CMD DATA FF

Parameter reading format A8 8A FE LEN CMD (CHANNEL) FF
Network operation format: F5 LEN CMD DATA FF
F5: fixed head
LEN: the actual length of DATA
CMD: Actual named ID
DATA: actual parameters
FF: end of command
Configuration return: FC CMD STATUS
FC: fixed head
CMD: Actual named ID
STATUS: 00 operation is successful
01 operation failed

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6.5.2 Commands for Reading

Commands	ID	Format	Examples
Read device type	01	Send: FE 01 01 FF Reply: FB 01 dev_type	Send: FE 01 01 FF Reply: FB 01 03
Read network status	02	Send: FE 01 02 FF Reply: FB 02 nwk_state	Send: FE 01 02 FF Reply: FB 02 02
Read network PAN_ID	03	Send: FE 02 03 FF Reply: FB 03 pan_id	Send: FE 02 03 FF Reply: FB 03 FE 5B
Read local network short address	05	Send: FE 02 05 FF Reply: FB 05 Short_Addr	Send: FE 02 05 FF Reply: FB 05 F6 FA
Read local MAC address	06	Send: FE 08 06 FF Reply: FB 06 Mac_Addr	Send: FE 08 06 FF Reply: FB 06 1F 1C 21 FE FF 57 B4 14
Read the short network address of the parent node	07	Send: FE 02 07 FF Reply: FB 07 Coor_shortAddr	Send: FE 02 07 FF Reply: FB 07 00 00
Read the MAC address of the parent node	08	Send: FE 08 08 FF Reply: FB 08 Coor _Mac_Addr	Send: FE 08 08 FF Reply: FB 08 0C 46 0C FE FF 9F FD 90
Read network group number	09	Send: FE 01 09 FF Reply: FB 09 group	Send: FE 01 09 FF Reply: FB 09 01
Read communication channel	0A	Send: FE 01 0A FF Reply: FB 0A channel	Send: FE 01 0A FF Reply: FB 0A 0B
Read transmit power	0B	Send: FE 01 0B FF Reply: FB 0B txpower	Send: FE 01 0B FF Reply: FB 0B 0A
Read serial port baud rate	0C	Send: FE 01 0C FF Reply: FB 0C baud	Send: FE 01 0C FF Reply: FB 0C 09
Read sleep time	0D	Send: FE 01 0D FF Reply: FB 0D sleep_time	Send: FE 01 0D FF Reply: FB 0D 54
Read the short network address of the target	23	Send: FE 02 23 FF Reply: FB 23 Dec_ShortAddr	Send: FE 02 23 FF Reply: FB 23 00 00
Read the network group number of the target	24	Send: FE 01 24 FF Reply: FB 24 Dec_netid	Send: FE 01 24 FF Reply: FB 24 00
Read the long address of the target	25	Send: FE 08 25 FF Reply: FB 25 Dec_mac	Send: FE 08 25 FF Reply: FB 25 0A 1C 21 FE FF 57 B4 14
Read system sending mode	26	Send: FE 01 26 FF Reply: FB 26 send_mode	Send: FE 01 26 FF Reply: FB 26 02
Read data output method	27	Send: FE 01 27 FF Reply: FB 27 out_mode	Send: FE 01 27 FF Reply: FB 27 00
Read node rejoin period	29	Send: FE 01 29 FF	Send: FE 01 29 FF

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		Reply: FB 29 net_rejoinperiod	Reply: FB 29 05
Read the maximum number of reconnections of the lost parent node	30	Send: FE 01 30 FF Reply: FB 30 net_rejoincount	Send: FE 01 30 FF Reply: FB 30 05
Read wireless configuration ID	31	Send: FE 02 31 FF Reply: FB 31 header	Send: FE 02 31 FF Reply: FB 31 A8 8A
Read all network parameters of the device	FE	Send: FE 2F FE FF Reply: FB FE all_info	Send: FE 2F FE FF Reply: FB FE 03 02 FE 5B F6 FA 1F 1C 21 FE FF 57 B4 14 00 00 0C 46 0C FE FF 9F FD 90 01 0B 0A 09 54 00 00 00 0A 1C 21 FE FF 57 B4 14 02 00 FF 05 05 A8 8A
Read remote/local GPIO level	20	Send: FE 03 20 GpioId FF Reply: FB 20 GpioId In/Out level	Send: FE 03 20 00 FF Reply: FB 20 00 01 01
Read remote/local PWM parameters	21	Send: FE 06 21 PWMId FF Reply: FB 21 PWMId start/stop Period Period duty duty	Send: FE 06 21 00 FF Reply: FB 21 00 01 0A 3E 63 50
Read local/remote ADC status	22	Send: FE 03 22 adcid FF Reply: FB 22 adcid voltage1 voltage2	Send: FE 03 22 00 FF Reply: FB 22 00 0C E4
Read firmware version number	34	Send: FE 03 34 FF Reply: FB 34 FirmwareVersion	Send: FE 03 34 FF Reply: FB 34 82 69 01
Read the delayed printing time of AUX wake up external MCU serial port in wireless receiving state	35	Send: FE 01 35 FF Reply: FB 35 AUX_delaytime	Send: FE 01 35 FF Reply: FB 35 04
Read serial port wake-up hold time	36	Send: FE 01 36 FF Reply: FB 36 Uart_holdtime	Send: FE 01 36 FF Reply: FB 36 64
Read endpoint information	37	Send: FE 05 37 FF Reply: FB 37 Endpoint_info	Send: FE 05 37 FF Reply: FB 37 01 FE B0 05 04
Read the trust center connection key	38	Send: FE 10 38 FF Reply: FB 10 TrustCentLinkKey	Send: FE 10 38 FF Reply: FB 38 5A 69 67 42 65 65 41 6C 6C 69 61 6E 63 65 30 39

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6.5.2 Commands for Configuration

Configure device type	Send: FD 01 01 dev_type FF Reply: FA 01	Send: FD 01 01 03 FF Reply: FA 01
Configure PAN_ID	Send: FD 02 03 pan_id FF Reply: FA 03	Send: FD 02 03 FE 5B FF Reply: FA 03
Configure network group number	Send: FD 01 09 group FF Reply: FA 09	Send: FD 01 09 01 FF Reply: FA 09
Configure communication channel	Send: FD 01 0A channel FF Reply: FA 0A	Send: FD 01 0A 0B FF Reply: FA 0A
Configure transmit power (0-10 corresponds to power)	Send: FD 01 0B txpower FF Reply: FA 0B	Send: FD 01 0B 0A FF Reply: FA 0B
Configure the serial port baud rate	Send: FD 01 0C baud FF Reply: FA 0C	Send: FD 01 0C 09 FF Reply: FA 0C
Configure sleep time (valid for terminal)	Send: FD 01 0D sleep_time FF Reply: FA 0D	Send: FD 01 0D 54 FF Reply: FA 0D
Configure the target network short address	Send: FD 02 23 dec_addr FF Reply: FA 23	Send: FD 02 23 00 00 FF Reply: FA 23
Configure the target network group number	Send: FD 01 24 netid FF Reply: FA 24	Send: FD 01 24 00 FF Reply: FA 24
Configure the target long address	Send: FD 08 25 dec_mac FF Reply: FA 25	Send: FD 08 25 0A 1C 21 FE FF 57 B4 14 FF Reply: FA 25
Configure system sending mode	Send: FD 01 26 mode FF Reply: FA 26	Send: FD 01 26 02 FF Reply: FA 26
Configure the data output mode of the module	Send: FD 01 27 mode FF Reply: FA 27	Send: FD 01 27 00 FF Reply: FA 26
Configure node rejoin period	Send: FD 01 29 time FF Reply: FA 29	Send: FD 01 29 05 FF Reply: FA 29
The maximum number of rejoins after the node loses its parent	Send: FD 01 30 time FF Reply: FA 30	Send: FD 01 30 05 FF Reply: FA 30
Configure wireless remote configuration ID	Send: FD 02 31 header FF Reply: FA 31	Send: FD 02 31 A8 8A FF Reply: FA 31
Configure all network parameters	Send: FD 1A FE all_info FF Reply: FA FE	Send: FD 1A FE 03 FE 5B 01 0B 0A 09 54 00 00 00 0A 1C 21 FE FF 57 B4 14 02 00 FF 05 05 A8 8A FF Reply: FA FE
Configuration Remote/local GPIO input and output status	Send: FD 03 20 GpioId In/Out level FF Reply: FA 20	Send: FD 03 20 00 01 01 FF Reply: FA 20
Configure remote/local PWM status	Send: FD 06 21 PwmId start/stop Period1 Period2 duty1 duty2	Send: FD 06 21 00 FF 03 65 02 48 FF

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	FF Reply: FA 21	Reply: FA 21
Device restart	Send: FD 00 12 FF Reply: FA 12	Send: FD 00 12 FF Reply: FA 12
reset	Send: FD 00 13 FF Reply: FA 13	Send: FD 00 13 FF Reply: FA 13
Configure the delayed printing time for AUX to wake up the external MCU serial port in the wireless receiving state	Send: FD 01 35 AUX_delaytime FF Reply: FA 35	Send: FD 01 35 04 FF Reply: FA 35
Configure serial port wake-up hold time	Send: FD 01 36 Uart_holdtime FF Reply: FA 36	Send: FD 01 36 64 FF Reply: FA 36
Configure endpoint information	Send: FD 05 37 Endpoint_info FF Reply: FA 37	Send: FD 05 37 01 FE B0 05 04 FF Reply: FA 37
Configure the trust center connection key	Send: FD 10 38 TrustCentLinkKey FF Reply: FA 38	Send: FD 10 38 5A 69 67 42 65 65 41 6C 6C 69 61 6E 63 65 30 39 FF Reply: FA 38

6.5.3 Commands for Network Configuration

Open Network	Send: F5 01 40 01 FF Reply: FC 40 00	Send: F5 01 40 01 FF Reply: FC 40 00
Leave Network	Send: F5 01 40 02 FF Reply: FC 40 00	Send: F5 01 40 02 FF Reply: FC 40 00
New Network	Send: F5 01 40 03 FF Reply: FC 40 00	Send: F5 01 40 03 FF Reply: FC 40 00

Open Network: The main coordinator node is effective, which means that the open network allows the terminal to join for a period of time. The command configures the "centralized network open time" parameter. This command is invalid for the terminal and the sleeping terminal. Only the coordinator node (E180-Z8910SX/P) is valid .

Leave Network: The coordinator executes this command to clear the original network, and at the same time creates a new network. The terminal node executes this command to clear the saved network, and then executes the restart or new network command to join the new network.

New Network: mainly for terminals, execute this command to join a new network, you need to leave the network and then execute the new network to join the new network.

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6.6 HEX Commands

6.6.1 System sending mode

Command format for Read:

Format	Examples
Send: FE 01 26 FF Reply: FB 26 send_mode	Send: FE 01 26 FF Reply: FB 26 02

Command format for Configuration:

Format	Examples
Send: FD 01 26 mode FF Reply: FA 26	Send: FD 01 26 02 FF Reply: FA 26

Modes:

0x01 Multicast (you need to configure the target group number in configuration mode first).

0x02 Transparent transmission on demand + short address (need to configure the target short address in configuration mode).

0x03 transparent transmission on demand + long address (need to configure the target long address in configuration mode).

0x04 Protocol on-demand + short address (the first two bytes in the transmission mode are the network short address of the target device).

0x05 protocol multicast (the first byte in the transmission mode is the target network group number).

6.6.2 Commands for Output type when Receiving Data

Command format for Read:

Command Format	Command Example
Send: FE 01 27 FF Reply: FB 27 out_mode	Send: FE 01 27 FF Reply: FB 27 00

Command format for Configuration:

Command Format	Command Example
Send: FD 01 27 mode FF Reply: FA 27	Send: FD 01 27 00 FF Reply: FA 26

Mode:

0x00 transparent transmission (default).

0x01 data + short address.

0x02 data + long address.

0x03 data+RSSI;

0x04 data + short address + RSSI.

0x05 data + long address + RSSI.

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Note: The dormant terminal device does not support the resolution of the long address of the source device when receiving data. When the terminal device receives data, it can resolve the long address of the source sending device such as the coordinator, router and terminal, but the coordinator and router cannot resolve the source sending device of the terminal. The long address, the coordinator and router here are E180-Z8910SX/P products.

Note: The sender supports a single packet with a maximum data packet length of 72 bytes

6.6.3 Types of Network Devices

Command format for Read:

Command Format	Command Example
Send: FE 01 01 FF Reply: FB 01 dev_type	Send: FE 01 01 FF Reply: FB 01 03

Command format for Configuration:

Command Format	Command Example
Send: FD 01 01 dev_type FF Reply: FA 01	Send: FD 01 01 03 FF Reply: FA 01

Dev_type:

0x03 terminal (default)

0x04 Sleep terminal

The configuration of changing the node type needs to be restarted to take effect. During normal operation, the device configured with the node type will leave the current network in a non-network state, and will switch to the changed node type after restarting. The dormant terminal supports the wake-up function of the serial port receiving pin. The length of the wake-up frame is less than or equal to 5 bytes. It is recommended to use "FF FF FF FF FF" 5 bytes to wake up.

6.6.4Network Status

Command format for Read:

Command Format	Command Example
Send: FE 01 02 FF Reply: FB 02 nwk_state	Send: FE 01 02 FF Reply: FB 02 02

nwk_state:

0x00 No network

0x02 has joined the network

0x03 There is a network but no parent node

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6.6.5 Network PAN_ID

Command format for Read:

Command Format	Command Example
Send: FE 02 03 FF Reply: FB 03 pan_id	Send: FE 02 03 FF Reply: FB 03 FE 5B

Command format for Configuration:

Command Format	Command Example
Send: FD 02 03 pan_id FF Reply: FA 03	Send: FD 02 03 FE 5B FF Reply: FA 03

pan_id:

0x0000～0xFFFE fixed network PAN_ID

0xFFFF random network PAN_ID

Note: If the coordinator is configured as 0xFFFF, then PANID is randomly selected to establish a network. Terminals, routing, etc. can be configured with 0xFFFF to join any PANID network. PANID parameters need to be configured before joining the network.

6.6.6 Network Short Address:

Command format for Read:

Command Format	Command Example
Send: FE 02 05 FF Reply: FB 05 Short_Addr	Send: FE 02 05 FF Reply: FB 05 F6 FA

Short_Addr:2 Byte, Address randomly assigned by the coordinator

6.6.7 MAC Address

Command format for Read:

Command Format	Command Example
Send: FE 08 06 FF Reply: FB 06 Mac_Addr	Send: FE 08 06 FF Reply: FB 06 1F 1C 21 FE FF 57 B4 14

Mac_Addr: 8 Byte

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6.6.8 Parent node network short address

Command format for Read:

Command Format	Command Example
Send: FE 02 07 FF Reply: FB 07 Coor_shortAddr	Send: FE 02 07 FF Reply: FB 07 00 00

Coor_shortAddr: 2 Byte.This is the short address of the parent node of the current node. The short address of the coordinator is 0x0000.

6.6.9 Parent node MAC address

Command format for Read:

Command Format	Command Example
Send: FE 08 08 FF Reply: FB 08 Coor _Mac_Addr	Send: FE 08 08 FF Reply: FB 08 0C 46 0C FE FF 9F FD 90

Coor_Mac_Addr: 8 Byte ,The long address of the parent node of the current node

6.6.10 Network group number

Command format for Read:

Command Format	Command Example
Send: FE 01 09 FF Reply: FB 09 group	Send: FE 01 09 FF Reply: FB 09 01

Command format for Configuration:

Command Format	Command Example
Send: FD 01 09 group FF Reply: FA 09	Send: FD 01 09 01 FF Reply: FA 09

group:Group number range 0x01～0xFE (default 1)

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6.6.11Network Channel

Command format for Read:

Command Format	Command Example
Send: FE 01 0A FF Reply: FB 0A channel	Send: FE 01 0A FF Reply: FB 0A 0B

Command format for Configuration:

Command Format	Command Example
Send: FD 01 0A channel FF Reply: FA 0A	Send: FD 01 0A 0B FF Reply: FA 0A

channel: Channel range 0x0B(11)～0x1A(26) (default 11 channels), 0xFF means full channel scan.

The channel parameter needs to be configured before entering the network.

6.6.12 Transmitting Power

Command format for Read:

Command Format	Command Example
Send: FE 01 0B FF Reply: FB 0B txpower	Send: FE 01 0B FF Reply: FB 0B 0A

Command format for Configuration:

Command Format	Command Example
Send: FD 01 0B txpower FF Reply: FA 0B	Send: FD 01 0B 0A FF Reply: FA 0B

txpower: The transmit power level (00) needs to be configured before entering the network.

Power Code	**Target Power (dbm）**	**Power Code**	**Target Power (dbm）**
00	11.76	06	10.33
01	11.66	07	10.04
02	11.31	08	9.73
03	11.09	09	9.38
04	10.82	0A	9.03
05	10.54		

Note: The transmitting power subjects to the actual value.

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6.6.13 Serial Port Baud Rate

Command format for Read:

Command Format	Command Example
Send: FE 01 0C FF Reply: FB 0C baud	Send: FE 01 0C FF Reply: FB 0C 09

Command format for Configuration:

Command Format	Command Example
Send: FD 01 0C baud FF Reply: FA 0C	Send: FD 01 0C 09 FF Reply: FA 0C

Table of baud rate code and baud value:

Code	Target baud rate	Code	Target baud rate
01	4800	08	76800
02	9600	09	115200（default）
03	14400	0A	128000
04	19200	0B	230400
05	38400	0C	256000
06	50000	0D	460800
07	57600		

Note: To change the baud rate configuration of serial communication, you need to restart the device for the changed baud rate to take effect.

6.6.14 Sleeping Time

Command format for Read:

Command Format	Command Example
Send: FE 01 0D FF Reply: FB 0D sleep_time	Send: FE 01 0D FF Reply: FB 0D 54

Command format for Configuration(only for terminal):

Command Format	Command Example
Send: FD 01 0D sleep_time FF Reply: FA 0D	Send: FD 01 0D 54 FF Reply: FA 0D

When the node is a sleeping terminal, the functions are as follows:

sleep_time: (1～60) Sleep wake-up period means 1～60 unit (seconds)

(61～255) Sleep wake-up period representation 60+(sleep_time-60)*10 unit (seconds)

The default value of the parameter is 10, which means 10 seconds. It means the sleep period, it also represents the data request period, and also represents the heartbeat period. Less than 30 seconds can receive the data sent by the parent node. The shorter the period, the less the delay in receiving data. The shorter the period, the faster the optimal parent node switching speed. The faster the detection of missing parent nodes is.

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When the node is a terminal, the time functions are as follows:

If the node is a terminal, this parameter represents the heartbeat period of the terminal and the parent node. The faster the heartbeat period, the faster the terminal switches the route to find the best parent node, and at the same time coordinates the heartbeat to detect the online status of the terminal.

sleep_time:

Code	Target Heartbeat period(Seconds)
1	3
10	40
20	80
30	160
40	320
50	640
60	1280

Note: If the nodes are coordinators and routers, this parameter is invalid.

6.6.15 Save Time for Parent Node

Time: The parent node saves the data of its child nodes for 30 seconds. If a terminal node needs to receive data from the parent node, the sleep time configuration cannot be longer than 30 seconds.

Note: This parameter is the parameter of the parent node (router and coordinator), temporarily saves the data buffered and sent to the sleeping node. The parent node (router and coordinator) is E180-Z8910SX/P product

6.6.16 Rejoin Period for Nodes

Command format for Read:

Command Format	Command Example
Send: FE 01 29 FF Reply: FB 29 net_rejoinperiod	Send: FE 01 29 FF Reply: FB 29 05

Command format for Configuration:

Command Format	Command Example
Send: FD 01 29 time FF Reply: FA 29	Send: FD 01 29 05 FF Reply: FA 29

Rejoin period:

(1～254) The range of reconnection period is 1～254. The unit is minute. The default is 1 minute.

When the node is powered on, it will join the network (if there is no network status) or restore the network (if there is no network status) or restore the network (if there is no parent node status). When the node is running, it will rejoin the network after the parent node is offline. even. When the parameter is 254, it means that no reconnection or periodic screening will be performed.

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6.6.17 Maximum number of reconnection attempts

Command format for Read:

Command Format	Command Example
Send: FE 01 30 FF Reply: FB 30 net_rejoincount	Send: FE 01 30 FF Reply: FB 30 05

Command format for Configuration:

Command Format	Command Example
Send: FD 01 30 time FF Reply: FA 30	Send: FD 01 30 05 FF Reply: FA 30

Rejoin maxcount:

(1～254) The range of maximum reconnection times is 1～254 times, the default is 10

After the node is running, if the parent node is lost or there is a network without a parent node, the maximum number of rejoin attempts are attempted after power-on. If the previous network has not been restored, the previous network information will be cleared, and new networks will be scanned periodically to join with the Rejoin period. The power consumption of scanning the new network is higher than the power consumption of the network before restoration.

When the parameter is 254, it means that reconnection is always executed without clearing the network when there is a network without a parent node.

6.6.18 Wireless remote configuration ID

Command format for Read:

Command Format	Command Example
Send: FE 02 31 FF Reply: FB 31 header	Send: FE 02 31 FF Reply: FB 31 A8 8A

Command format for Configuration:

Command Format	Command Example
Send: FD 02 31 header FF Reply: FA 31	Send: FD 02 31 A8 8A FF Reply: FA 31

Remote Header:

0x0000 means to close the wireless network configuration, 0x0001～0xFFFF means to open the remote configuration, the default setting is 0xA88A (0xA8 0x8A).

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6.6.19 User GPIO parameters

Command format for Read:

Command Format	Command Example
Send: FE 03 20 GpioId FF Reply: FB 20 GpioId In/Out level	Send: FE 03 20 00 FF Reply: FB 20 00 01 01

Command format for Configuration:

Command Format	Command Example
指令:FD 03 20 GpioId In/Out level FF Reply: FA 20	Send: FD 03 20 00 01 01 FF Reply: FA 20

gpioPeripheral configuration data format (3 Byte): GpioId In/Out level.

gpioid :Channel ID

Channel ID	GPIO interface
00	PC0 interface
01	PB4 interface

In/Out: Channel output/input mode

0 output

1 input

level: the level status of the channel

0 low level

1 high level

2 flip

Note: When configured as input, level represents the input level value 0 (low level) or 1 (high level), when configuring output, level represents 0 (low level), 1 (high level), 2 (electrical Flat flip) output.

6.6.20User PWM parameters

Command format for Read:

Command Format	Command Example
Send: FE 06 21 PWMId FF Reply: FB 21 PWMId start/stop Period Period duty duty	Send: FE 06 21 00 FF Reply: FB 21 00 01 0A 3E 63 50

Command format for Configuration:

Command Format	Command Example
Send:FD 06 21 PwmId start/stop Period1 Period2 duty1 duty2 FF	Send: FD 06 21 00 FF 03 65 02 48 FF Reply: FA 21

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Reply: FA 21	

PwmPeripheral configuration data format (6 Byte): PwmId start/stop Period1 Period2 duty1 duty2

PwmId :Channel ID

Channel ID	PWM GPIO interface
0x00	PC2 interface
0x01	PD2 interface
0x02	PC3 interface
0x03	PC4 interface

start/stop: start and stop channel PWM output

0xFF means to start PWM in 1mS unit, the parameter range is 0-340, then the maximum period that can be set is 340mS. When the period parameter is less than 2, the period parameter is 2, and the period is 2mS (2*1mS).

0xFE means to start PWM with 0.5uS as the unit. The parameter range is 0-3400, and the maximum period that can be set is 1700uS (3400*0.5). When the period parameter is less than 2, the period parameter is 2, and the period is 1uS (2*0.5uS).

0x00 means stop PWM

period: pwm cycle time (determine the unit of the cycle and the maximum cycle according to the start/stop byte)

Period1 represents the upper 8 bits of the period

Period2 indicates that the lower 8 of the period is

duty: pwm duty cycle time (according to the start/stop byte to determine the cycle unit and maximum cycle)

duty1 represents the high 8 bits of the duty cycle

duty2 represents the lower 8 bits of the duty cycle

Note:

1. The period value must be greater than the duty cycle duty. It is recommended that the difference between the period period and the duty cycle duty be greater than 2ms. If the period is less than the duty cycle, the system will default to the period equal to twice the duty cycle duty. The empty ratio represents the high level time.

The PWM period units of 2.4 channels need to be the same, and some of the 4 channels cannot be configured at ms level and some are configured at us level, because the frequency division coefficients of millisecond level and microsecond level are different, if some are configured to millisecond level, Some configurations are at the microsecond level, which will cause the frequency division coefficient to be based on the last configuration.

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6.6.21 User adc parameter

Command format for Read:

Command Format	Command Example
Send: FE 03 22 adcid FF Reply: FB 22 adcid voltage1 voltage2	Send: FE 03 22 00 FF Reply: FB 22 00 0C E4

Adc: Peripheral read data format (3 Byte): acid voltage 1 voltage2

adcid:ADCChannel ID

Channel ID	ADC GPIO interface
0x00	VDD Power supply voltage detection
0x01	PB6 interface
0x02	PB7 interface

voltage: ADC channel voltage value read (unit mV)

The detectable range is 0x0000～0x0E74 (0～3700)

voltage 1 means high 8 bits

voltage 2 means lower 8 bits

Column such as read value: voltage =0x0C voltage =0xE4

The voltage value is: voltage = 0x0CE4

Note:

1. If the power supply voltage is the highest 3.3V, the detection range of the ADC can reach 3.3V at this time

The interval between reading the ADC voltage value of the same device twice must be greater than 10ms

6.6.22 Configure all network parameters

Command format for Configuration:

Command Format	Command Example
Send: FD 1A FE all_info FF Reply: FA FE	Send: FD 1A FE 03 FE 5B 01 0B 0A 09 54 00 00 00 0A 1C 21 FE FF 57 B4 14 02 00 FF 05 05 A8 8A FF Reply: FA FE

all_info:FD 1A FE 03 FE 5B 01 0B 0A 09 54 00 00 00 0A 1C 21 FE FF 57 B4 14 02 00 FF 05 05 A8 8A FF

Node type 03. PANID FE 5B. Network group number 01. Channel 0B. Transmit power 0A. Baud rate 09. Sleep time 54. Target network short address 00 00. Target network group number 00. Target long address 0A 1C 21 FE FF 57 B4 14. System sending mode 02. Data output mode 00. Network open time FF (not supported by this module of non-coordinator). Period of rejoin 05. Number of rejoins 05. Wireless ID A8 8A.

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6.6.23 Read all network parameters

Command format for Read:

Send: FE 2F FE FF Reply: FB FE all_info	Send: FE 2F FE FF Reply: FB FE 03 02 FE 5B F6 FA 1F 1C 21 FE FF 57 B4 14 00 00 0C 46 0C FE FF 9F FD 90 01 0B 0A 09 54 00 00 00 0A 1C 21 FE FF 57 B4 14 02 00 FF 05 05 A8 8A

all_info:FB FE 03 02 FE 5B F6 FA 1F 1C 21 FE FF 57 B4 14 00 00 0C 46 0C FE FF 9F FD 90 01 0B 0A 09 54 00 00 00 0A 1C 21 FE FF 57 B4 14 02 00 FF 05 05 A8 8A

Node type 03. Network status 02. Network short address FE 5B. Local network short address F6 FA. Local MAC address 1F 1C 21 FE FF 57 B4 14. Parent node network short address 00 00. Parent node MAC address 0C 46 0C FE FF 9F FD 90. Network group number 01. Channel 0B. Transmit power 0A. Baud rate 09. Sleep time 54. Target network short address 00 00. Target network group number 00. Target long address 0A 1C 21 FE FF 57 B4 14 System sending mode 02. Data output method 00. Network open time FF (the coordinator is valid and this module does not support). Rejoin cycle 05. Rejoin times 05. Wireless ID A8 8A.

6.6.24 In the wireless receiving state, AUX wakes up the external MCU serial port to delay printing time

Command format for Read:

Command Format	Command Example
Send: FE 01 35 FF Reply: FB 35 AUX_delaytime	Send: FE 01 35 FF Reply: FB 35 04

Command format for Configuration:

Command Format	Command Example
Send: FD 01 35 AUX_delaytime FF Reply: FA 35	Send: FD 01 35 04 FF Reply: FA 35

AUX_delaytime :1～255 The unit is ms, and the default parameter is 4ms, that is, after the module receives wireless data, it first pulls down the AUX pin to wake up the external MCU, and then delays 4ms to output the serial port data to the external MCU.

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6.6.25Configure serial port wake-up hold time

Command format for Read:

Command Format	Command Example
Send: FE 01 36 FF Reply: FB 36 Uart_holdtime	Send: FE 01 36 FF Reply: FB 36 64

Command format for Configuration:

Command Format	Command Example
Send: FD 01 36 Uart_holdtime FF Reply: FA 36	Send: FD 01 36 64 FF Reply: FA 36

Uart_holdtime: 1～255, the unit is 10ms, the default parameter is 100, that is, the serial port will keep waking up for 100*10ms after waking up, and then going to sleep after 1000ms.

6.6.26Configure Nodes information

Command format for Read:

Command Format	Command Example
Send: FE 05 37 FF Reply: FB 37 Endpoint_info	Send: FE 05 37 FF Reply: FB 37 01 FE B0 05 04

Command format for Configuration:

Command Format	Command Example
Send: FD 05 37 Endpoint_info FF Reply: FA 37	Send: FD 05 37 01 FE B0 05 04 FF Reply: FA 37

Endpoint_info:5 bytes, the data format is: endpoint clusterId_H clusterId_L profileId_H profileId_L

Default parameters: endpoint 0x01, clusterId 0xfeb0, profileId 0x0504。

endpoint	clusterId		profileId	
	clusterId_H	clusterId_L	profileId_H	profileId_L
01	FE	B0	05	04

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6.6.27 Configure the trust center connection key

Command format for Read:

Command Format	Command Example
Send: FE 10 38 FF Reply: FB 38 TrustCentLinkKey	Send: FE 10 38 FF Reply: FB 38 5A 69 67 42 65 65 41 6C 6C 69 61 6E 63 65 30 39

Command format for Configuration:

Command Format	Command Example
Send: FD 10 38 TrustCentLinkKey FF Reply: FA 38	Send: FD 10 38 5A 69 67 42 65 65 41 6C 6C 69 61 6E 63 65 30 39 FF Reply: FA 38

TrustCentLinkKey:16Bytes, the default value is the default key of the ZigBee Alliance and its value is

0x5A 0x69 0x67 0x42 0x65 0x65 0x41 0x6C

0x6C 0x69 0x61 0x6E 0x63 0x65 0x30 0x39

After the device restarts, the configuration takes effect.

Note: Only the connected device holding the same link key (LinkKey) as the trust center (coordinator) can it connect to the network of the trust center (coordinator), and the trust center (coordinator) transmits the network key to the connected device , The connected device completes the process of joining the network to obtain the network key for normal communication.

6.6.28 Firmware version instruction parameter

Command format for Read:

Command Format	Command Example
Send: FE 03 34 FF Reply: FB 34 FirmwareVersion	Send: FE 03 34 FF Reply: FB 34 82 58 01

Firmware_version: 82 58 00

82 58 means Telink 8258.

00 means the firmware version number

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7 FAQ

7.1 Communication range is too short

- The communication distance will be affected when obstacle exists.
- Temperature, humidity, and co-frequency interference will increase the communication packet loss rate.
- The ground absorbs and reflects radio waves, and the test effect is poor near the ground.
- Sea water has a strong ability to absorb radio waves, so the seaside test results are poor.
- If there is a metal object near the antenna or placed in a metal shell, the signal attenuation will be very serious.
- The power register is set incorrectly, and the air rate is set too high (the higher the air rate, the closer the distance).
- The low voltage of the power supply at room temperature is lower than the recommended value, the lower the voltage, the lower the power output.
- The matching degree of the antenna and the module is poor or the quality of the antenna itself is problematic.

7.2 Module is easy to damage

- Please check the power supply to ensure that it is between the recommended power supply voltage. If it exceeds the maximum value, it will cause permanent damage to the module.
- Please check the stability of the power supply.
- Please ensure anti-static operation during installation and use, and high-frequency components are electrostatically sensitive.
- Please ensure that the humidity during installation and use should not be too high, and some components are humidity sensitive.
- If there is no special requirement, it is not recommended to use it at too high or too low temperature.

7.3 Bit error rate is too high

- There is co-channel signal interference nearby, stay away from the interference source or modify the frequency and channel to avoid interference.
- Unsatisfactory power supply may also cause garbled codes. Ensure the reliability of the power supply.
- Poor or too long extension cables and feeders can also cause high bit error rates.

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8 Revision history

Version	Date	Description	Issued by
1.0	2018/04/16	initial version	-
1.1	2019/4/01	Bug modification	Ly
1.3	2023-02-23	Bug modification	Bin
1.4	2023-03-09	Bug modification	Bin

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