

Tuya Wi-Fi communication protocol

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Product information

Product name: Electrical Outlet

Product ID: bhvdmzhfa9bnnft1

Product functions:

dpID	Function name	Data transmission type	Data type	Function attribute	Remarks
1	Switch 1	Issue and report	bool		
2	Switch 2	Issue and report	bool		
3	Switch 3	Issue and report	bool		
4	Switch 4	Issue and report	bool		
5	Switch 5	Issue and report	bool		
6	Switch 6	Issue and report	bool		
7	Switch 7	Issue and report	bool		
8	Switch 8	Issue and report	bool		
9	Countdown 1	Issue and report	value	Values range: 0-86400, Pitch: 1, Unit: s	
10	Countdown 2	Issue and report	value	Values range: 0-86400, Pitch: 1, Unit: s	
11	Countdown 3	Issue and report	value	Values range: 0-86400, Pitch: 1, Unit: s	
12	Countdown 4	Issue and report	value	Values range: 0-86400, Pitch: 1, Unit: s	
13	Countdown 5	Issue and report	value	Values range: 0-86400, Pitch: 1, Unit: s	
14	Countdown 6	Issue and report	value	Values range: 0-86400, Pitch: 1, Unit: s	
15	Countdown 7	Issue and report	value	Values range: 0-86400, Pitch: 1, Unit: s	
16	Countdown 8	Issue and report	value	Values range: 0-86400, Pitch: 1, Unit: s	
17	Add Electricity	Issue and report	value	Values range: 0-50000, Pitch: 100, Unit:	
18	Current	Only report	value	Values range: 0-30000, Pitch: 1, Unit: mA	
19	Power	Only report	value	Values range: 0-50000, Pitch: 1, Unit: W	
20	Voltage	Only report	value	Values range: 0-5000, Pitch: 1, Unit: V	
21	Test Bit	Only report	value	Values range: 0-5, Pitch: 1, Unit:	
22	电压校准系数	Only report	value	Values range: 0-1000000, Pitch: 1, Unit:	

23	电流校准系数	Only report	value	Values range: 0-1000000, Pitch: 1, Unit:	
24	功率校准系数	Only report	value	Values range: 0-1000000, Pitch: 1, Unit:	
25	电量校准系数	Only report	value	Values range: 0-1000000, Pitch: 1, Unit:	
26	Fault	Only report	fault		ov_cr: 过流保护
27	Led Switch	Issue and report	bool		
28	Mode	Issue and report	enum	Enumerated values: white, colour, scene, scene_1, scene_2, scene_3, scene_4	
29	Brightness	Issue and report	value	Values range: 25-255, Pitch: 1, Unit:	
30	Color Temp	Issue and report	value	Values range: 0-255, Pitch: 1, Unit:	
31	Color Mode	Issue and report	string	Maxium Length: 255	
32	Scene Mode	Issue and report	string	Maxium Length: 255	
33	Scene 1	Issue and report	string	Maxium Length: 255	
34	Scene 2	Issue and report	string	Maxium Length: 255	
35	Scene 3	Issue and report	string	Maxium Length: 255	
36	Scene 4	Issue and report	string	Maxium Length: 255	
37	Led Countdown	Issue and report	value	Values range: 0-86400, Pitch: 1, Unit: s	
38	全部开关	Issue and report	bool		

Communication protocol

Serial communication protocol

Baud rate: 9600

Data bits: 8

Parity check: None

Stop bit: 1

Data flow control: None

MCU: Control panel control chip, connect with Tuya module through serial port

Frame format description

Field	Length(byte)	Description
Header	2	Fixed to 0x55aa
Version	1	Used for upgrade and expansion
Command word	1	Specific frame type
Data length	2	Big end
Data	N	
Checksum	1	Use the result by bytes sum from the header to get remainder of 256

Communication protocol - basic protocol

- 1. The heartbeat detection
 - 1.1 Power on module. Send the heartbeat periodically at 10s interval. If the MCU response is not received within the

timeout period (3s), the MCU is considered offline;

1.2 The MCU can also periodically check whether the module is working properly based on the heartbeat.

- 2. Check product information

2.1 Product ID is generated when development platform creates a product. It is fixed to 8 bytes. It is the unique ID for the product, used for recording product and function information;

2.2 If the MCU does not support the upgrade, the default MCU version number is 1.0.0. If the MCU supports the upgrade, the version number format is defined as "x.x.x" ($0 \leq x \leq 99$).

- 3. Query how the MCU sets the module

Module's working mode refers to Wi-Fi working status and the method to reset Wi-Fi. There are two methods: :

3.1 MCU and module are coordinated to process

Modules notifies the current MCU Wifi Working status through serial port and MCU provides display support; MCU detects reset requirement and notifies module to reset Wifi through serial port;

3.2 Module self processing

Wi-Fi working status displays through GPIO pin driver LED status; Wi-Fi reset is processed through GPIO input requirement;

If the product adopts the module self-processing mode, then ignore the following 4-6 protocol. Module self-processing WiFi reset method: When it detects that GPIO entry low level is more than 5s and it trigger module reset.

- 4. Report module working status

Module working status (3 types)	Corresponding indicator status
Module network configuration status	Flashing (The interval flashes 250ms)
Module is successfully configured, but not connected to router	Off state
Module is successfully configured and connected to router	Long bright state

- 5. Reset module

When the module is networked, you can reset it so that the device is in the state to be networked. After resetting, enter network configuration state by default.

- 6. Command issued and status reported

For product function's command issued and status reported, please see the protocol as below "Communication Protocol (Product Function Part) Send and Receive Orders."

- 7. Query the MCU working status

7.1 Power on the module for the first time, establish connection with MCU through heartbeat, query and send;

7.2 During module working process, it detects that MCU restarts or occurrence of offline and then on-line process, query and send;

- Communication protocol (basic protocol) instruction

		Header version	Command word	Data length	Data	Checksum
Heartbeat detection	Module send	0x55aa 0x00	0x00	0x0000		0xff
	MCU report	0x55aa 0x00	0x00	0x0001	0x00(first time) 0x01(others)	Checksum
Query product information	Module send	0x55aa 0x00	0x01	0x0000		0x00
	MCU report	0x55aa 0x00	0x01	xxxx	PID + mcu version(1.0.0)	Checksum
Query MCU Set module Working mode	Module send	0x55aa 0x00	0x02	0x0000		0x01
	MCU report(MCU and module coordinate to process)	0x55aa 0x00	0x02	0x0000		0x01
	MCU report(Module self process)	0x55aa 0x00	0x02	0x0002	The first byte is the Wi-Fi status indicating the GPIO sequence number; the secondary byte is the Wi-Fi reset key GPIO serial number	Checksum
Report module working status	Module send	0x55aa 0x00	0x03	0x0001	Indication module status: 0x00: network connection mode (rapid light flashing); ; 0x01: Module configuration is successful, but not connected to router(light is off);	Checksum

						0x02: Module configuration is successful and connected to router (Light is long bright);	
	• MCU report	• 0x55aa 0x00	• 0x03	• 0x0000	•		• 0x02
• Reset module	• MCU send	• 0x55aa 0x00	• 0x04	• 0x0000	•		• 0x03
	• Module report	• 0x55aa 0x00	• 0x04	• 0x0000	•		• 0x03
• Query MCU working status	• Module send	• 0x55aa 0x00	• 0x08	• 0x0000	•		• 0x07
•							

• Communication protocol – functional protocol

Communication protocol (product function part) instruction sent and received form

• ID	• Function name	•	• Header version	• Command word	• Data length	• dpID	• Data type	• Function length	• Function command	• Checksum
• 38	• 全部开关	•	• 0x55aa 0x00	•	• 0x00 0x05	• 0x26	• 0x01	• 0x00 0x01	• off:0x00 on:0x01	• Checksum