

Tuya serial port communication protocol

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on-product information

Product name: EPT-Ultrasonic sensor Z

Product ID: lvkk 0hdg

product function:

d pID	Function name	Data transfer type	data type	Functional attributes	remarks
1	Liquid status	Only report	en um	Enumeration range: nor mal, lower _ala rm, upper _alar m	
2	Level depth	Only report	valu e	Numerical range: 0-1 0000, spacing: 1, unit: m	
7	Upper limit setting	Can be issued or reported	valu e	Numerical range: 0-1 00, spacing: 1, unit:%	
8	Lower limit setting	Can be issued or reported	valu e	Numerical range: 0-1 00, spacing: 1, unit:%	
19	mounting height	Can be issued or reported	valu e	Numerical range: 100- 2500, spacing: 1, unit: m	
21	Level maximum depth	Can be issued or reported	valu e	Numerical range: 100- 1000, spacing: 1, unit: m	
22	Liquid level ratio	Only report	valu e	Numerical range: 0-1 00, spacing: 1, unit:%	

protocol

Serial port communication agreement

Baud rate: 9600

Data bit: 8

Parity Check: None

Stop bit: 1

Data flow control: None

MCU: the control board control chip, docking with the doodle module through the serial port

Low-power wake-up mechanism: is only effective for low-power devices, strong power devices do not need to wake IO; PWM 1 is used for module wake up MCU; PWM 2 is used for MCU wake-up module; default high level, low level for more than 10ms; wake up for 100ms, before each data interaction, need to wake up through IO before sending data;

Timeout mechanism: passive reporting (synchronous response) timeout time of 100ms, active reporting (asynchronous response) timeout time 5s;

●Frame format description

field	Length (byte)	explain
Frame head	2	Fix to 0x 55aa
edition	1	Upgrade and expand
serial number	2	Transfer data serial number (ascending order)
CW	1	Specific frame type
DL	2	main aspects
data	xx xx	
check sum	1	From the frame head, the results of 256

●Communication protocol-the basic protocol

1. Query the product information

1.1 product ID: The corresponding PID (product ID) of the Tuya developer platform is generated by the Tuya developer platform and used to record product related information in the cloud;

1.2 Definition of serial port protocol software version number format: adopt the point decimal form, " x.x . And x " (0 x 9), x is the decimal number.

1.3 The product information consists of product ID and the serial port protocol software version number.

Example: {"p": "BDzkjuLY", "v": "2.0.0"}

The p indicates the product ID BDzkjuLY, v the mcu, version 2.0.0;

55	AA	02	00	00	01	00	1C	7B	22	70	22	3A	22	42	44
Frame head	version number	serial number	CW	DL	{	"	P	"	:	"	B	D			
7A	6B	6A	75	4C	59	22	2C	22	76	22	3A	22	32	2E	30
z	k	j	u	L	Y	"	,	"	v	"	:	"	2	.	0
2E	30	22	7D	89											
.	0	"	}	bit											

2. Report the module network status

There are three types of module network states:

0x 00: The equipment is not in the network state;

0x 01: The equipment is in the network state;

0x 02: abnormal equipment network status;

2.1 Equipment not entering the network: if the first power access fails or if the network is disconnected; and the status is distributed to the MCU.

.22 The device is in the network: after the success of the device, the state is Has; and send the status to and to MCU MCU.

.32 When the module detects the MCU, restart or breaks the MCU and then the process, actively send the module network state to the MCU.

2.4 When the network status of the module changes, proactively send the network status of the module to the MCU.

3. Device networking status

There are two kinds of device networking states:

3.1 0x 00: Soft reset of the module, clear the stack data, and save the network status;

3.2 0x 01: Configure the module to start the distribution network state;

4. Command issuance and status reporting

For the command issuing and status reporting protocol for the product function, please refer to the Communication Protocol (Product Function Part) instruction release below.

5. MCU working status reporting condition

5.1 When the status of the module network changes (no network access- no network access): After receiving the module network status command, the MCU needs to report the status of all functions (switch, mode, etc.);

5.2 Passive reporting: When the MCU receives the control command issued by the module end and performs the corresponding action, the mcu needs to report the new status to the module end;

5.3 Active report: When MCU status changes (non-app control, such as control board button), mcu needs to actively report it;

5.4 Regular report: If there is a timing function, the MCU shall report the remaining time of the countdown every minute, in minutes.

6. ZigBee module production and measurement

Scan the SSID of the specified channel to return the scan result and signal intensity percentage, mainly for ZigBee RF function test during the product production; this test requires TuyaZigBee test Dongle;

The 7. MCU OTA upgrade

The MCU upgrade requires uploading the MCU upgrade firmware on the Doodle developer platform, and then click on the APP to check the firmware upgrade;

.17 After the completion of the equipment distribution network, MCU will actively push the current version number to the gateway (the gateway will also actively read it);

7.2 After receiving the push from the APP, the gateway will inform the MCU of the firmware upgrade information (PID, version number, large firmware Small, firmware calibration sum, etc.);

7.3 MCU initiates upgrade firmware request, including firmware id, firmware version number to be upgraded, data offset, data size (a frame data request is 50 bytes) and other information;

7.4 After the upgrade is completed, the MCU needs to report the upgraded status and the version number of the new firmware to the module end;

8. Get the local time (optional)

Support to obtain the network local time and UTC time, the results return 8 bytes, the first 4 bytes are the standard time stamp, and the last four Bytes are local timestamps in seconds.

9. Communication protocol (basic protocol) instructions are received and issued

Serial number is filled in according to the actual data

		Frame head version	order Number	order character	DL	data	verifi cation And
Query the product information	module transmit by radio	0x 55aa 0x 02	0xXXX X	0x01	0x 0000	N /A	verifi cation And
	MCU appear in the newspapers	0x 55aa 0x 02	0xXXX X	0x01	0x 001c	Format: {"p": "BDzkjuLY", "v": "2.0.0"}	verifi cation And
Report the	module transmit by	0x 55aa 0x 02	0xXXX X	0x02	0x 0001	0x 00: Not in the net; 0x 01: in the net	verifi cation And

module network status	radio							
	MCU return	0x 55aa 0x 02	0x XXXX	0x02	0x 0000	N /A	verification And	
Configure the ZigBee module	MCU transmit by radio	0x 55aa 0x 02	0x XXXX	0x03	0x 0001	0x 00: reset module; 0x 01: Reset and distribution network;	verification And	
	module return	0x 55aa 0x 02	0x XXXX	0x03	0x 0000	N /A	verification And	
Order issued	module transmit by radio	0x 55aa 0x 02	0x XXXX	0x04	0xXXXX	Actual DP data information shall be received and published with reference to the protocol instructions;	verification And	
Status Reporting (Passive)	MCU transmit by radio	0x 55aa 0x 02	0x XXXX	0x05	0xXXXX	Actual DP data information shall be received and published with reference to the protocol instructions;	verification And	
	module return	0x 55aa 0x 02	0x XXXX	0x05	0x 0001	0x01	verification And	
Status report (master)	MCU transmit by radio	0x 55aa 0x 02	0x XXXX	0x06	0xXXXX	Actual DP data information shall be received and published with reference to the protocol instructions;	verification And	

move)	module return	0x 55aa 0x 02	0xXXX X	0x06	0x 0001	0x01	verification And
ZigBee Functional test (Note: Scan the specified SSID of the specified channel)	MCU hair deliver	0x 55aa 0x 02	0xXXX X	0x08	0x 0001	00x0b	verification And
	module return	0x 55aa 0x 02	0xXXX X	0x08	0x 0002	Data length 2 bytes: Data [0]: 0x 00 failed, 0x 01 successful; when Data [0] is 0x01, Data [1] indicates signal intensity (0-100, 0 worst, 100 strongest) when Data [0] is 0 x 00, failed, Data [1] = 0x00 indicates no scan to the specified ssid, Data [1] = 0x01 indicates that the module is not burn authorization key	verification And
MCU OTA Version request	module transmit by radio	0x 55aa 0x 02	0xXXX X	0x0B	0x 0000	N /A	verification And
	MCU return circle	0x 55aa 0x 02	0xXXX X	0x0B	0x 0001	MCU, version number	verification And
MCU OTA Upgrade notification	module transmit by radio	0x 55aa 0x 02	0xXXX X	0x0C	0x 0011	Data [0] -data [7]: pid; data [8]: version number, 01.00.0001 (bit) -> 1.0.1 (decimal); data [9] -data [12]: firmware size; data [13] -data [16]: firmware checksum, sums from the first byte to 2 ^ 32;	verification And
	MCU return circle	0x 55aa 0x 02	0xXXX X	0x0C	0x 0001	0x 00: Success; 0x 01: failure;	verification And
MCU OTA Firmware content request	MCU hair deliver	0x 55aa 0x 02	0xXXX X	0x0D	0x 000E	Data [0] -data [7]: pid; data [8]: version number, 01.00.0001 (bit) -> 1.0.1 (decimal); data [9] -data [12]: firmware offset; data [13]: packet length (no more than 50 bytes);	verification And
	module return	0x 55aa 0x 02	0xXXX X	0x0D	0x 00 0 xXX	Data [0]: status, 0x 00 successful, 0x 01 failed; data [1] -data [8]: pid; data [9]: 01.00.0001 (bit) -> 1.0.1 (decimal); data [10] -data [13]: firmware offset; data [14] -data [0 xXX]: firmware content;	verification And
MCU OTA Firmware upgrade results are reported	MCU hair deliver	0x 55aa 0x 02	0xXXX X	0x0E	0x 000A	Data [0]: status, 0x 00 successful, 0x 01 failed; data [1] -data [8]: pid; data [9]: 01.00.0001 (bit) -> 1.0.1 (decimal);	verification And
	module return	0x 55aa 0x 02	0xXXX X	0x0E	0x 0001	0x 00: Success; 0x 01: failure;	verification And
Get local time (optional)	MCU falling rising tone report	0x 55aa 0x 02	0xXXX X	0x24	0x 0000	N /A	verification And
	module transmit by radio	0x 55aa 0x 02	0xXXX X	0x24	0x 0008	Data length is 8 bytes:, the first four bytes are standard timestamps, and the last four bytes are local timestamps	verification And

•Communication protocol-function protocol

Communication protocol (product function part) instruction is received and published

ID	Function name	Frame head edition	serial number	CW	DL	d pID	data type	Function length	function command	check examine
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1	Level status	MCU falling-rising tone report	0x55aa0x02	0xXXXX	0x05	0x000x05	0x01	0x04	0x000x01	normal :0x 00 lower_alarm :0x 01 upper_alarm :0x 02	check sum
2	Level depth	MCU falling-rising tone report	0x55aa0x02	0xXXXX	0x05	0x000x08	0x02	0x02	0x000x04	0x 0-0x 2710	check sum
7	Upper limit setting	The Module is sent	0x55aa0x02	0xXXXX	0x04	0x000x08	0x07	0x02	0x000x04	0x 0-0x 64	check sum
		MCU falling-rising tone report	0x55aa0x02	0xXXXX	0x05	0x000x08	0x07	0x02	0x000x04		check sum
8	The lower limit set	The Module is sent	0x55aa0x02	0xXXXX	0x04	0x000x08	0x08	0x02	0x000x04	0x 0-0x 64	check sum

	place	MCU falling-rising tone report	0x55aa0x02	0xXXXX	0x05	0x000x08	0x08	0x02	0x000x04		check sum
19	mounting height	The Module is sent	0x55aa0x02	0xXXXX	0x04	0x000x08	0x13	0x02	0x000x04	0x64-0x9c4	check sum
		MCU falling-rising tone report	0x55aa0x02	0xXXXX	0x05	0x000x08	0x13	0x02	0x000x04		check sum
21	Level maximum depth	The Module is sent	0x55aa0x02	0xXXXX	0x04	0x000x08	0x15	0x02	0x000x04	0x64-0x3e8	check sum
		MCU falling-rising tone report	0x55aa0x02	0xXXXX	0x05	0x000x08	0x15	0x02	0x000x04		check sum
22	Level ratio	MCU falling-rising tone report	0x55aa0x02	0xXXXX	0x05	0x000x08	0x16	0x02	0x000x04	0x0-0x64	check sum