



User Manual

WizFi360

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Manufacture:WIZnet H.K. LTD.



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1. Introduction

WizFi360 WiFi module is independently developed by WIZnet. The module integrates 32-bit MCU with a main frequency of up to 80MHz. It supports embedded RTOS, PRNG/SHA1/MD5/RC4/DES/3DES/AES/CRC and other encryption and decryption protocols. The 1 MB Flash and WiFi MAC/BB/RF/PA/LNA universal encryption hardware accelerator are integrated, and the PCB onboard antenna scheme of 3D BI is adopted.

The module supports IEEE802.11 b/g/n protocol and complete TCP/IP protocol stack. Users can use this module to add networking functions to existing devices, or to build independent network controllers.

WizFi360 is a complete and self-contained WiFi network solution that can run independently or as a slave host MCU. The module can be booted directly from internal flash memory when it carries applications and acts as the only application processor in the device. The built-in cache is conducive to improving system performance and reducing memory requirements.

In another case, when WizFi360 is responsible for the task of WiFi adapter, it can be added to any microcontroller-based design. The connection is simple and easy, just through SPI/SDIO interface or I2C/UART interface.



2. Features

- Support IEEE802.11 b/g/n
- Integrated 32-bit embedded Cortex-M3 CPU, operating frequency 80MHz, support RTOS
- Integrated TCP/IP stack
- Integrated PA/LNA/TR-Switch
- Integrated encryption hardware accelerator, support PRNG,SHA1,MD5,RC4,DES,3DES,AES,CRC,RSA
- Integrated 2.4G RF transceiver'support IEEE802.11 protocol
- Support Wi-Fi WMM/WMM-PS/WPA/WPA2/WPS
- Support 20/40M Bandwidth
- Support STBC, Greenfield, Short-GI and reverse transmission;
- Support AMPDU, AMSDU,RIFS
- Support STA/AP/STA+AP mode
- Support AT remote upgrade
- Support for Smart Config (including Android and iOS devices)
- Support HSPI!UART!I2C!I2S!SDIO2.0!7816 interface!PWM!GPIO
- Integrated power supply control circuit
- Standby power consumption less than10uA
- Wake up, connect and transmit packets within 2ms
- Cyber security Software: Microsoft Defender (ver. 1.431.365.0)

15	GND	GND
16	PB10	UART1 RTS
17	PA4	UART0 TX
18	PA5	UART0 RX
19	PB7	IO
20	PB8	IO
21	PB11	UART1 RX
22	PB12	UART1 TX

5. Technical Specification

Table 2 Technical Specifications

Parameter	Typ	Unit
Input frequency	2400~2484	MHz
Sensitivity		
DSSS,1 Mbps	-95	dBm
CCK,11 Mbps	-86	dBm
OFDM,6 Mbps	-89	dBm
OFDM,54 Mbps	-73	dBm
HT20,MCS0	-89	dBm
HT20,MCS7	-71	dBm
HT40,MCS0	-85	dBm
HT40,MCS7	-68	dBm
Adjacent Channel restrain		
OFDM,6 Mbps	32	dB
OFDM,54 Mbps	15	dB

HT20,MCS0	29	dB
HT20,MCS7	10	dB

6. Memory Map

Table 3 Address Space Assignments

0x5FFF FFFF	512M-Byte Block 2
0X4000 0000	Peripherals
0X3FFF FFFF	512M-Byte Block 1
0X2000 0000	SRAM
0X1FFF FFFF	512M-Byte Block 0
0X0000 0000	Code

Table 4 Peripheral Address Space Assignments

Peripheral	BootMode=0	BootMode=1	Address Space	Description
ROM	0x00000000~ 0x0003FFFF	0x1FF00000~ 0x1FF3FFFF		Firmware
FLASH	0x08000000~ 0x080FFFFFFF	0x00000000~ 0x000FFFFFFF		Specific instruction Memory Space
SRAM	0x20000000~ 0x20027FFF	0x20000000~ 0x20027FFF		Firmware and instruction memory space
MAC RAM	0x20028000~ 0x2003FFFF	0x20028000~ 0x2003FFFF		SDIO/H_SPI/UART data buffer
CONFIG	0x40000000~ 0x40001FFF	0x40000000~ 0x40001FFF	0x40000000~0x400001FF	SDIO
			0x40000200~0x400002FF	SPI
			0x40000300~0x400003FF	SDIO Wrapper
			0x40000400~0x400005FF	DMA
			0x40000600~0x400006FF	PMU
			0x40000700~0x400007FF	Clock and Reset
			0x40000800~0x400009FF	
			0x40000A00~0x40000BFF	
			0x40000C00~0x40000DFF	
			0x40000E00~0x40000FFF	
			0x40002000~0x400021FF	FLASH Controller
			0x40002200~0x400023FF	RSA
			0x40002400~0x400025FF	GPSEC
APB	0x40010000~ 0x4003C000	0x40010000~ 0x4003C000	0x40010000~0x400101FF	I ² C Master
			0x40010200~0x400103FF	
			0x40010400~0x400107FF	SPI Master

		0x40010800~0x400109FF	UART0
		0x40010A00~0x40010BFF	UART1
		0x40010C00~0x40010DFF	GPIOA
		0x40010E00~0x40010FFF	Timer
		0x40011000~0x400111FF	WDOG
		0x40011200~0x400113FF	GPIOB
		0x40011400~0x400115FF	
		0x40011600~0x400117FF	
		0x40011800~0x400119FF	PWM
		0x40011A00~0x40011BFF	I ² S
		0x40011C00~0x40011DFF	7816/UART2
		0x40014000~0x4000BFFF	
		0x4001C000~0x4003BFFF	
		0x40013C00~0x5FFFFFFF	RSV

7. Interface Description

Table 5 Interface Description

Pin Name	Pin	Function Description
HSPI	PB_15(CS) PB_16(CK) PB_17(DI) PB_18(DO)	Support SPI protocol, has configurable data frame. The maximum data rate is 50Mbps.
PWM	PB_18(PWM1) PB_17(PWM2) PB_16(PWM3) PB_15(PWM4) PB_14(PWM5)	Has 5 PWM generators; Support 2 channels input capture (PWM0 and PWM4); Frequency range: 3Hz~160KHz; Duty ratio precision: 1/256, Dead-Zone counter: 8bit;
I2C	PB_11(I ² C_SCL) PB_12(I ² C_DAT) PB_13(I ² C_SCL) PB_14(I ² C_DAT)	I ² C Controller connects though APB Interface. Its supports master mode and configurable operating frequency [^] 100K-400K ^v .
UART	UART0: GPIOA_4(TXD) GPIOA_5(RXD) UART1: PB_12(TXD) PB_11(RXD)	A device that can be connected to a UART interface. download. UART0_TXD, UART0_RXD Communication. UART0_TXD, UART0_RXD UART1_TXD, UART1_RXD
I2S	Master. PA_5(I ² S_M_EXTCLK)	Support AMBA APB bus protocol, 32bit single read/write;

	PB_8(I ² S_M_SCL) PB_9(I ² S_M_SDA) PB_10(I ² S_M_RL) Slave. PB_14(I ² S_S_SDA) PB_15(I ² S_S_SCL) PB_16(I ² S_S_RL)	Operates as either Master or Slave, support full duplex; Capable of handling 8, 16, 24, 32 bits word size, sampling frequency is up to 128KHz; Support Mono and stereo audio data; Support I ² S and MSB justified data format, support PCM A/B data format; Support DMA data transfer, word access only.
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8. Ultimate Characteristics

Table 6 ultimate characteristic

Parameter	Symbol	Min	Typ	Max	Unit
VDD supply voltage	VDD	3.0	3.3	3.6	V
Input low voltage	V _{IL}	-0.3		0.8	V
Input high voltage	V _{IH}	2.0		VDD+0.3	V
Input capacitance	C _{pad}			2	pF
Output low voltage	V _{OL}			0.4	V
Output high voltage	V _{OH}	2.4			V
Max. output current	I _{MAX}			24	mA
Storage temperature	T _{STR}	-40		+125	°C
Operating temperature	T _{OPR}	-40		+85	°C

9. RF Power Parameters

Table 7 RF power parameters

Operation Mode	Typ	Unit
transmit IEEE802.11b, CCK 11Mbps, POUT = +19 dBm	230	mA
transmit IEEE802.11g, OFDM 54Mbps, POUT = +13.5 dBm	210	mA
transmit IEEE802.11n, OFDM MCS7, POUT = +12dBm	210	mA
receive IEEE802.11b/g/n	100-110	mA

10. Command Description

Each command set contains four types of AT commands

Type	Command Format	Description
Test Command	AT+<x>=?	Queries the Set Commands' internal parameters and their range of values.
Query Command	AT+<x>?	Returns the current value of parameters.
Set Command	AT+<x>=<...>	Sets the value of user-defined parameters in commands, and runs these commands.
Execute Command	AT+<x>	Runs commands with no user-defined parameters.

Notice:

- Not all AT commands support all four variations mentioned above.
- Square brackets [] designate the default value; it is either not required or may not appear.
- String values need to be included in double quotation marks, for example: AT+CWSAP="WizFi360", "WizFi360", 1, 4.
- The default baud rate is 115200
- AT commands have to be capitalized, and must end with a new line (CR LF).

10.1 %DVLF \$7 &RPPDQGV

10.1.1 Overview

No.	Commands	Description
1	AT	Tests AT startup.
2	AT+RST	Restarts the module
3	AT+GMR	Checks version information.
4	ATE	Configures echoing of AT commands.
5	AT+RESTORE	Restores the factory default settings of the module.
6	AT+UART	UART configuration.
7	AT+UART_CUR	The current UART configuration.
8	AT+UART_DEF	The default UART configuration, saved in flash.
9	AT+SYSRAM	Checks the available RAM size.
10	AT+CIOMODE	Configures the mode of GPIO.
11	AT+CIOWRITE	Configures the GPIO output level
12	AT+CIOREAD	Checks the GPIO input level.

10.1.2 Commands

10.1.2.1. AT Tests AT Startup

Execute Command	AT
Response	OK
Parameters	-

10.1.2.2 ^ AT+RST Restarts the Module

Execute Command	AT+RST
Response	OK
Parameters	-

10.1.2.3 ^ AT+GMR Checks Version Information

Execute Command	AT+GMR
Response	<AT version info> <SDK version info> <compile time> OK
Parameters	• <AT version info>.information about the AT version. • <SDK version info>.information about the SDK version. • <compile time>.the duration of time for compiling the BIN.

10.1.2.4 ^ ATE AT Commands Echoing

Execute Command	ATE
Response	OK
Parameters	• ATE0·echo off. • ATE1·echo on.

10.1.2.5 ^ AT+RESTORE Restores the Factory Default Settings

Execute Command	AT+RESTORE
Response	OK
Note	The execution of this command will reset all parameters saved in flash, and restore the factory default settings of the module. The chip will be restarted when this command is executed.

10.1.2.6 AT+UART UART Configuration

Execute Command	AT+UART?	AT+UART=<baudrate>,<databits>,<stopbits>,<parity>,<flow control>
Response	+UART:<baudrate>,<databits>,<stopbits>,<parity>,<flow control> OK	OK
Parameters	• <baudrate>: UART baud rate • <databits>: data bits ▶ 5: 5 bit data ▶ 6: 6 bit data ▶ 7: 7 bit data ▶ 8: 8 bit data • <stopbits>: stop bits ▶ 1: 1bit stop bits ▶ 2: 2bit stop bits • <parity>: parity bit ▶ 0: None ▶ 1: Odd ▶ 2: Even • <flow control>: flow control ▶ 0: flow control is not enabled ▶ 1: enable both RTS and CTS	
Note	• Command AT+UART? will return the actual value of UART configuration parameters, which may have allowable errors compared with the set value because of the clock division. For example, if the UART baud rate is set as 115200, the baud rate returned by using command AT+UART_CUR? could be 115273. • The configuration changes will be saved in the user parameter area in the flash, and will still be valid when the chip is powered on again. • The range of baud rates supported. 2000000' 1500000' 1250000' 1000000' 921600' 406800' 230400' 115200' 57600' 38400' 19200' 9600' 4800' 2400' 1800' 1200' 600	

Example	AT+UART=115200,8,1,0,0
----------------	------------------------

10.1.2.7

' AT+UART_CUR Current UART

Configuration; Not Saved in the Flash

Execute Command	AT+UART_CUR?	AT+UART_CUR=<baudrate>,<databits>,<stopbits>,<parity>,<flow control>
Response	+UART_CUR:<baudrate>,<data bits>,<stopbits>,<parity>,<flow control> OK	OK
Parameters	• <baudrate>: UART baud rate • <databits>: data bits ▶ 5: 5 bit data ▶ 6: 6 bit data ▶ 7: 7 bit data ▶ 8: 8 bit data • <stopbits>: stop bits ▶ 1: 1bit stop bits ▶ 2: 2bit stop bits • <parity>: parity bit ▶ 0: None ▶ 1: Odd ▶ 2: Even • <flow control>: flow control ▶ 0: flow control is not enabled ▶ 1: enable both RTS and CTS	
Notes	• AT+UART_CUR? will return the actual value of UART configuration parameters, which may have allowable errors compared with the set value because of the clock division. For example, if the UART baud rate is set as 115200, the baud rate returned by using command AT+UART_CUR? could be 115273. • The range of baud rates supported. 2000000' 1500000' 1250000' 1000000' 921600' 406800' 230400' 115200' 57600' 38400' 19200' 9600' 4800' 2400' 1800' 1200' 600	
Example	AT+UART_CUR=115200,8,1,0,0	

10.1.2.8' AT+UART_DEF

Default UART Configuration; Saved in the Flash

Execute Command	AT+UART_DEF?	AT+UART_DEF=<baudrate>,<databits>,<stopbits>,<parity>,<flow control>
Response	+UART_DEF:<baudrate>,<data bits>,<stopbits>,<parity>,<flow control> OK	OK
Parameters	• <baudrate>: UART baud rate • <databits>: data bits ▶ 5: 5 bit data ▶ 6: 6 bit data ▶ 7: 7 bit data ▶ 8: 8 bit data • <stopbits>: stop bits ▶ 1: 1bit stop bits ▶ 2: 2bit stop bits • <parity>: parity bit ▶ 0: None ▶ 1: Odd ▶ 2: Even • <flow control>: flow control ▶ 0: flow control is not enabled ▶ 1: enable both RTS and CTS	
Notes	• AT+UART_DEF? will return the actual value of UART configuration parameters, which may have allowable errors compared with the set value because of the clock division. For example, if the UART baud rate is set as 115200, the baud rate returned by using command AT+UART_CUR? could be 115273. • The configuration changes will be saved in the user parameter area in the flash, and will still be valid when the chip is powered on again. • The range of baud rates supported. 2000000' 1500000' 1250000' 1000000' 921600' 406800' 230400' 115200' 57600' 38400' 19200' 9600' 4800' 2400' 1800' 1200' 600	
Example	AT+UART_DEF=115200,8,1,0,0	

10.1.2.9' AT+SYSRAM Checks the Remaining Space of RAM

Execute Command	AT+SYSRAM _i
Response	+SYSRAM:<RAM> > OK
Parameters	<RAM>: remaining space of RAM, unit: byte.

Example	AT+SYSRAM?
----------------	------------

10.1.2.10 **AT+CIOMODE** Configures the Mode of a GPIO

Execute Command	AT+CIOMODE=<pin>,<mode>
Response	OK
Parameters	• <mode>.Operating mode -1.sets the GPIO as an output -0.sets the GPIO as an input
Example	AT+CIOMODE=6,1

10.1.2.11 **AT+CIOWRITE** Configures the Output Level of a GPIO

Execute Command	AT+CIOWRITE=<pin>,<level>
Response	OK
Parameters	• <level>. -1.high level -0.low level
Example	AT+CIOMODE=6,1 AT+CIOWRITE=6,0

10.1.2.12 **AT+CIOREAD** Reads the GPIO Input Level

Execute Command	AT+CIOREAD=<pin>
------------------------	------------------



Response	OK
Parameters	

Example`AT+CIOREAD=6`

10.2 Wi-Fi AT Commands

10.2.1 Overview

No.	Commands	Description
1	AT+CWMODE	Sets the Wi-Fi mode (STA/AP/STA+AP)
2	AT+CWMODE_CUR	Sets the Current Wi-Fi mode (STA/AP/STA+AP)' configuration not saved in the flash.
3	AT+CWMODE_DEF	Sets the default Wi-Fi mode(STA/AP/STA+AP)' configuration saved in the flash.
4	AT+CWJAP	Connects to an AP
5	AT+CWJAP_CUR	Connects to an AP, configuration not saved in the flash.
6	AT+CWJAP_DEF	Connects to an AP, configuration saved in the flash.
7	AT+CWLAPOPT	Sets the configuration of command AT+CWLAP.
8	AT+CWLAP	Lists available APs
9	AT+CWSAP	Sets WizFi360 SoftAP
10	AT+CWSAP_CUR	Sets WizFi360 SoftAP' configuration not saved in the flash
11	AT+CWSAP_DEF	Sets WizFi360 SoftAP' configuration saved in the flash
12	AT+CWLIF	Gets the Station IP to which the WizFi360 SoftAP is connected.
13	AT+CWQAP	Disconnects from an AP.
14	AT+CWDHCP	Enables/Disables DHCP
15	AT+CWDHCP_CUR	Enables/Disables DHCP, configuration not saved in the flash.
16	AT+CWDHCP_DEF	Enables/Disables DHCP, configuration saved in the flash.
17	AT+CIPSTA	Sets the IP address of the WizFi360 Station
18	AT+CIPSTA_CUR	Sets the IP address of the WizFi360 Station, configuration not saved in the flash.
19	AT+CIPSTA_DEF	Sets the IP address of the WizFi360 Station, configuration saved in the flash.
20	AT+CIPAP	Sets the IP address of the WizFi360 SoftAP

21	AT+CIPAP_CUR	Sets the IP address of the WizFi360 SoftAP, configuration not saved in the flash.
22	AT+CIPAP_DEF	Sets the IP address of the WizFi360 SoftAP, configuration saved in the flash.
23	AT+CIPSTAMAC_CUR	Sets the IP address of the WizFi360 Station MAC, not configuration saved in the flash.
24	AT+CIPSTAMAC_DEF	Sets the IP address of the WizFi360 Station MAC, configuration saved in the flash.
25	AT+CWSTARTSMART	Starts SmartConfig.
26	AT+CWSTOPSMART	Stops SmartConfig.
27	AT+CWAUTOCONN	Connects to an AP automatically on power-up.

10.2.2 Commands

10.2.2.1 **AT+CWMODE** Sets the mode(Station/SoftAP/Station+Softap)

Commands	AT+CWMODE=?	AT+CWMODE?	AT+CWMODE=<mode>
Response	+CWMODE:<mode> List of values OK	+CWMODE:<mode> OK	OK
Parameters	<mode>: ▶ 1:Station mode ▶ 2:SoftAP mode ▶ 3:SoftAP+Station mode		
Note	• Power on device defaults to Station mode		
Example	AT+CWMODE=1		

10.2.2.2 **AT+CWMODE_CUR** Sets the Current Wi-Fi mode, Configuration Not Saved in the Flash

Commands	AT+CWMODE_CUR=?	AT+CWMODE_CUR?	AT+CWMODE_CUR=<mode>
----------	-----------------	----------------	----------------------

Response	+CWMODE_CUR:<mode> e> List of values OK	+CWMODE_CUR:<mode> OK	OK
Parameters	<mode>: ▶ 1:Station mode ▶ 2:SoftAP mode ▶ 3:SoftAP+Station mode		
Note	Power on device defaults to Station mode		
Example	AT+CWMODE_CUR=1		

10.2.2.3. AT+CWMODE_DEF Sets the Default Wi-Fi mode; Configuration

Saved in the Flash

Commands	AT+CWMODE_DEF=?	AT+CWMODE_DEF?	AT+CWMODE_DEF=<mode>
Response	+CWMODE_DEF:<mode> e> List of values OK	+CWMODE_DEF:<mode> OK	OK
Parameters	<mode>: ▶ 1:Station mode ▶ 2:SoftAP mode ▶ 3:SoftAP+Station mode		
Note	Power on device defaults to Station mode		
Example	AT+CWMODE_DEF=1		

10.2.2.4. AT+CWJAP Connects to an AP

Commands	AT+CWJAP?	AT+CWJAP=<ssid>,<pwd>[,<bssid>]
Response	+CWJAP:<ssid>,<bssid>,<channel>,<rsi> OK	OK or +CWJAP:<error code> FAIL
Parameters	<ssid>.the SSID of the target AP. <bssid>.the target AP's MAC address	<ssid>.the SSID of the target AP. <pwd>.password, MAX: 64-byte

	• <channel>.channel • <rsssi>.Signal strength	ASCII. • [<bssid>].optional parameter, the target AP's MAC address, used when multiple APs have the same SSID. • <error code>. (IRU UHIHUFH RQO\) ▶ 1.connection timeout. ▶ 2.wrong password. ▶ 3.cannot find the target AP. ▶ 4.connection failed. This command requires Station mode to be enabled.Escape character syntax is needed if SSID or password contains any special characters, such as ,or " or \.
Note	• The configuration changes will be saved in the flash. • If multiple APs have the same SSID, the target AP can be found by BSSID	
Examples	AT+CWJAP="WIZnet","wiznet2018","f4:83:cd:9e:d4:40"	

10.2.2.5. AT+CWJAP_CUR Connects to an AP; Configuration Not Saved in the Flash

Commands	AT+CWJAP_CUR?	AT+CWJAP_CUR=<ssid>,<pwd>[,<bssid>]
Response	+CWJAP_CUR:<ssid>,<bssid>,<channel>,<rsssi> OK	OK or +CWJAP_CUR:<error code> FAIL
Parameters	• <ssid>.the SSID of the target AP • <bssid>.the target AP's MAC address • <channel>.channel • <rsssi>.Signal strength	• <ssid>.the SSID of the target AP • <pwd>.password, MAX: 64-byte ASCII • [<bssid>].optional parameter, the target AP's MAC address, used when multiple APs have the same SSID. • <error code>.(IRU UHIHUFH RQO\) ▶ 1.connection timeout. ▶ 2.wrong password. ▶ 3.cannot find the target AP. ▶ 4.connection failed. This command requires Station mode to be enabled.Escape character syntax is needed if SSID or password contains any special

		characters, such as ,or " or \.
Note	If multiple APs have the same SSID, the target AP can be found by BSSID	
Examples	AT+CWJAP_CUR="WIZnet","wiznet2018","f4:83:cd:9e:d4:40"	

10.2.2.6. AT+CWJAP_DEF Connects to an AP; Configuration Saved in the Flash

Commands	AT+CWJAP_DEF?	AT+CWJAP_DEF=<ssid>,<pwd>[,<bssid>]
Response	+CWJAP_DEF:<ssid>,<bssid>,<channel>,<rssi> OK	OK or +CWJAP_DEF:<error code> FAIL
Parameters	<ssid>.the SSID of the target AP <bssid>.the target AP's MAC address <channel>.channel <rssi>.Signal strength	<ssid>.the SSID of the target AP <pwd>.password, MAX: 64-byte ASCII [<bssid>].optional parameter, the target AP's MAC address, used when multiple APs have the same SSID. <error code>.(IRU UHIHUHQFH RQO\) ▶ 1.connection timeout. ▶ 2.wrong password. ▶ 3.cannot find the target AP. ▶ 4.connection failed. This command requires Station mode to be enabled.Escape character syntax is needed if SSID or password contains any special characters, such as ,or " or \.
Note	- The configuration changes will be saved in the system parameter area in the flash. - If multiple APs have the same SSID, the target AP can be found by BSSID	
Examples	AT+CWJAP_DEF="WIZnet","wiznet2018","f4:83:cd:9e:d4:40"	

10.2.2.7. AT+CWLAPOPT Sets the Configuration for the Command AT+CWLAP

Command	AT+CWLAPOPT=<sort_enable>,<mask>
Response	OK or

	ERROR
Parameters	• <sort_enable>.determines whether the result of command AT+CWLAP will be listed according to RSSI: • <mask>.determines the parameters shown in the result of AT+CWLAP; 0 means not showing the parameter corresponding to the bit, and 1 means showing it. ▶ bit 0.determines whether <ecn> will be shown in the result of AT+CWLAP. ▶ bit 1.determines whether <ssid> will be shown in the result of AT+CWLAP. ▶ bit 2.determines whether <rss> will be shown in the result of AT+CWLAP. ▶ bit 3.determines whether <mac> will be shown in the result of AT+CWLAP. ▶ bit 4.determines whether <ch> will be shown in the result of AT+CWLAP.
Example	AT+CWLAPOPT=1,31

10.2.2.8. AT+CWLAP Lists Available APs

Commands	AT+CWLAP=<ssid>	AT+CWLAP
Response	+CWLAP:<ecn>,<ssid>,<rss>,<mac> ,<channel> OK or ERROR	+CWLAP:<ecn>,<ssid>,<rss>,<mac> ,<channel> OK
Parameters	• <ecn>.encryption method ▶ 0.OPEN ▶ 1.WEP ▶ 2.WPA_PSK ▶ 3.WPA2_PSK ▶ 4.WPA_WPA2_PSK • <ssid>.string parameter, SSID of the AP • <rss>.signal strength • <mac>.string parameter, MAC address of the AP. • <channel>.channel number	
Examples	AT+CWLAP	

10.2.2.9. AT+CWSAP Configures the WizFi360 SoftAP

Commands	AT+CWSAP?	AT+CWSAP=<ssid>,<pwd>, <chl>,<ecn>[,<max conn>][,<ssid
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		hidden>]
Response	+CWSAP:<ssid>,<pwd>,<chl>,<ecn>,<max conn>,<ssid hidden>	OK or ERROR
Parameters	• <ssid>: string parameter, SSID of AP • <pwd>: string parameter, length of password: 8 ~ 64 bytes ASCII. • <chl>: channel ID. • <ecn>: encryption method ▶ 0: OPEN ▶ 2: WPA_PSK ▶ 3: WPA2_PSK • [<max conn>](optional√.maximum number of Stations to which WizFi360 SoftAP can be connected; within the range of [1, 4]. • [<ssid hidden>](optional√. ▶ 0: SSID is broadcasted. (the default setting) ▶ 1: SSID is not broadcasted	
Note	• The configuration changes will be saved in the flash	
Example	AT+CWSAP="WIZnet","wiznet2018",4,3	

10.2.2.10. AT+CWSAP_CUR Configures the WizFi360 SoftAP; Configuration Not Saved in the Flash

Commands	AT+CWSAP_CUR?	AT+CWSAP_CUR=<ssid>,<pwd>,<chl>,<ecn>[,<max conn>][,<ssid hidden>]
Response	+CWSAP_CUR:<ssid>,<pwd>,<chl>,<ecn>,<max conn>,<ssid hidden>	OK or ERROR
Parameters	• <ssid>: string parameter, SSID of AP • <pwd>: string parameter, length of password: 8 ~ 64 bytes ASCII. • <chl>: channel ID. • <ecn>: encryption method ▶ 0: OPEN ▶ 2: WPA_PSK ▶ 3: WPA2_PSK • [<max conn>](optional√.maximum number of Stations to which WizFi360 SoftAP can be connected; within the range of [1, 4]. • [<ssid hidden>](optional√.	

	▶ 0: SSID is broadcasted. (the default setting) ▶ 1: SSID is not broadcasted
Example	AT+CWSAP_CUR="WIZnet","wiznet2018",5,3

10.2.2.11. AT+CWSAP_DEF Configures the WizFi360 SoftAP; Configuration

Saved in the Flash Flash

Commands	AT+CWSAP_DEF?	+CWSAP_DEF:<ssid>,<pwd>,<chl>,<ecn>,<max conn>,<ssid hidden>
Response	+CWSAP_DEF=<ssid>,<pwd>,<chl>,<ecn>[,<max conn>][,<ssid hidden>]	OK or ERROR
Parameters	• <ssid>: string parameter, SSID of AP • <pwd>: string parameter, length of password: 8 ~ 64 bytes ASCII. • <chl>: channel ID. • <ecn>: encryption method ▶ 0: OPEN ▶ 2: WPA_PSK ▶ 3: WPA2_PSK • [<max conn>](optional). maximum number of Stations to which WizFi360 SoftAP can be connected; within the range of [1, 4]. • [<ssid hidden>](optional). ▶ 0: SSID is broadcasted. (the default setting) ▶ 1: SSID is not broadcasted	
Example	AT+CWSAP_DEF="WIZnet","wiznet2018",5,3	

10.2.2.12. AT+CWLIF IP of Stations to Which the WizFi360 SoftAP is

Connected

Command	AT+CWLIF
Response	+CWLIF:<ip addr>,<mac> OK
Parameters	• <ip addr>: IP address of Stations to which WizFi360 SoftAP is connected. • <mac>: MAC address of Stations to which WizFi360 SoftAP is connected
Note	• This command cannot get a static IP. It only works when both DHCPs of the WizFi360 SoftAP, and of the Station to which WizFi360 is connected, are

	enabled.
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10.2.2.13. AT+CWQAP Disconnect from the AP

Commands	AT+CWQAP
Response	OK
Parameters	-

10.2.2.14. AT+CWDHCP Enables/Disables DHCP

Commands	AT+CWDHCP?	AT+CWDHCP=<mode>,<en>
Response	DHCP disabled or enabled now	OK
Parameters	- Bit0: ▶ 0: SoftAP DHCP is disabled ▶ 1: SoftAP DHCP is enabled - Bit1: ▶ 0: Station DHCP is disabled ▶ 1: Station DHCP is enabled	<mode>: ▶ 0: Sets WizFi360 SoftAP ▶ 1: Sets WizFi360 Station ▶ 2: Sets WizFi360 SoftAP and Station <en>: ▶ 0: Disables DHCP ▶ 1: Enable DHCP
Notes	- The configuration changes will be saved in flash. - This Set Command interacts with static-IP-related AT commands (AT+CIPSTA-related and AT+CIPA-related commands). - If DHCP is enabled, static IP will be disabled; - If static IP is enabled, DHCP will be disabled; - Whether it is DHCP or static IP that is enabled depends on the last configuration.	
Example	AT+CWDHCP=0,1	

10.2.2.15. AT+CWDHCP_CUR Enables/Disables DHCP; Configuration Not Saved in the Flash

Commands	AT+CWDHCP_CUR?	AT+CWDHCP_CUR=<mode>,<en>
Response	DHCP disabled or enabled now	OK
Parameters	- Bit0: ▶ 0: SoftAP DHCP is disabled	<mode>: ▶ 0: Sets WizFi360 SoftAP

	▶ 1:SoftAP DHCP is enabled - Bit1: ▶ 0:Station DHCP is disabled ▶ 1:Station DHCP is enabled	▶ 1: Sets WizFi360 Station ▶ 2: Sets WizFi360 SoftAP and Station - <en>: ▶ 0: Disables DHCP ▶ 1: Enables DHCP
Notes	- The configuration changes will not be saved in flash. - This Set Command interacts with static-IP-related AT commands (AT+CIPSTA-related and AT+CIPA-related commands). - If DHCP is enabled, static IP will be disabled; - If static IP is enabled, DHCP will be disabled; - Whether it is DHCP or static IP that is enabled depends on the last configuration.	
Example	AT+CWDHCP_CUR=0,1	

10.2.2.16. AT+CWDHCP_DEF Enables/Disables DHCP; Configuration Saved in the Flash

Commands	AT+CWDHCP_DEF?	AT+CWDHCP_DEF=<mode>,<en>
Response	DHCP disabled or enabled now	OK
Parameters	- Bit0: ▶ 0:SoftAP DHCP is disabled ▶ 1:SoftAP DHCP is enabled - Bit1: ▶ 0:Station DHCP is disabled ▶ 1:Station DHCP is enabled	- <mode>: ▶ 0: Sets WizFi360 SoftAP ▶ 1: Sets WizFi360 Station ▶ 2: Sets WizFi360 SoftAP and Station - <en>: ▶ 0: Disables DHCP ▶ 1 Enables DHCP
Notes	- The configuration changes will be stored in the user parameter area in the flash. - This Set Command interacts with static-IP-related AT commands (AT+CIPSTA-related and AT+CIPA-related commands). ▶ If DHCP is enabled, static IP will be disabled; ▶ If static IP is enabled, DHCP will be disabled; ▶ Whether it is DHCP or static IP that is enabled depends on the last configuration.	
Example	AT+CWDHCP_DEF=0,1	

10.2.2.17. AT+CIPSTA Sets the Current IP Address of the WizFi360 Station

Commands	AT+CIPSTA?	AT+CIPSTA=<ip>[,<gateway>,<netmask>]
Response	+CIPSTA:<ip> +CIPSTA:<gateway> +CIPSTA:<netmask> OK	OK
Parameters	Notice. Only when the WizFi360 Station is connected to an AP can its IP address be queried.	• <ip>.string parameter, he IP address of the WizFi360 Station • [<gateway>].gateway • [<netmask>].netmask
Notes	• The configuration changes will be saved in the flash • The Set Command interacts with DHCP-related AT commands (AT+CWDHCP-related commands). - If static IP is enabled, DHCP will be disabled; - If DHCP is enabled, static IP will be disabled; - Whether it is DHCP or static IP that is enabled depends on the last configuration	
Example	AT+CIPSTA="192.168.10.100","192.168.10.1","255.255.255.0"	

10.2.2.18. AT+CIPSTA_CUR Sets the Current IP Address of the WizFi360, Configuration Not Saved in the Flash

Commands	AT+CIPSTA_CUR?	AT+CIPSTA_CUR=<ip>[,<gateway>,<netmask>]
Response	+CIPSTA_CUR:<ip> +CIPSTA_CUR:<gateway> +CIPSTA_CUR:<netmask> OK	OK
Parameters	Notice. Only when the WizFi360 Station is connected to an AP can its IP address be queried.	• <ip>.string parameter, he IP address of the WizFi360 Station • [<gateway>].gateway • [<netmask>].netmask
Notes	• The configuration changes will be saved in the flash • The Set Command interacts with DHCP-related AT commands (AT+CWDHCP-related commands). - If static IP is enabled, DHCP will be disabled;	

	- If DHCP is enabled, static IP will be disabled; - Whether it is DHCP or static IP that is enabled depends on the last configuration
Example	AT+CIPSTA_CUR="192.168.10.100","192.168.10.1","255.255.255.0"

10.2.2.19. AT+CIPSTA_DEF Sets the Current IP Address of the WizFi360, Configuration Saved in the Flash

Commands	AT+CIPSTA_DEF?	AT+CIPSTA_DEF=<ip>[,<gateway>,<netmask>]
Response	+CIPSTA_DEF:<ip> +CIPSTA_DEF:<gateway> +CIPSTA_DEF:<netmask> OK	OK
Parameters	Notice. Only when the WizFi360 Station is connected to an AP can its IP address be queried.	• <ip>.string parameter, he IP address of the WizFi360 Station • [<gateway>].gateway • [<netmask>].netmask
Notes	• The configuration changes will be saved in the flash • The Set Command interacts with DHCP-related AT commands (AT+CWDHCP-related commands). - If static IP is enabled, DHCP will be disabled; - If DHCP is enabled, static IP will be disabled; - Whether it is DHCP or static IP that is enabled depends on the last configuration	
Example	AT+CIPSTA_DEF="192.168.10.100","192.168.10.1","255.255.255.0"	

10.2.2.20. AT+CIPAP Sets the IP Address of the WizFi360 SoftAP

Commands	AT+CIPAP?	AT+CIPAP=<ip>[,<gateway>, <netmask>]
Response	+CIPAP:<ip> +CIPAP:<gateway> +CIPAP:<netmask> OK	OK
Parameters	• <ip>: string parameter, the IP address of the WizFi360 SoftAP. • [<gateway>]: gateway.	

	[<netmask>]: netmask.
Notes	- The configuration changes will be saved in the flash. - Currently, WizFi360 only supports class C IP addresses. - The Set Command interacts with DHCP-related AT commands (AT+CWDHCP-related commands). - If static IP is enabled, DHCP will be disabled; - If DHCP is enabled, static IP will be disabled; - Whether it is DHCP or static IP that is enabled depends on the last configuration.
Example	AT+CIPAP="192.168.10.100","192.168.10.1","255.255.255.0"

10.2.2.21. AT+CIPAP_CUR Sets the IP Address of the WizFi360 SoftAP, Configuration Not Saved in the Flash

Commands	AT+CIPAP_CUR?	AT+CIPAP_CUR=<ip>[,<gateway>,<netmask>]
Response	+ CIPAP_CUR.<ip> + CIPAP_CUR.<gateway> + CIPAP_CUR.<netmask> OK	OK
Parameters	<ip>: string parameter, the IP address of the WizFi360 SoftAP. [<gateway>]: gateway. [<netmask>]: netmask.	
Notes	- The configuration changes will not be saved in the flash - Currently, WizFi360 only supports class C IP addresses. - The Set Command interacts with DHCP-related AT commands (AT+CWDHCP-related commands). - If static IP is enabled, DHCP will be disabled; - If DHCP is enabled, static IP will be disabled; - Whether it is DHCP or static IP that is enabled depends on the last configuration.	
Example	AT+CIPAP_CUR="192.168.10.100","192.168.10.1","255.255.255.0"	

10.2.2.22. AT+CIPAP_DEF Sets the IP Address of the WizFi360 SoftAP, Configuration Saved in the Flash

Commands	AT+CIPAP_DEF?	AT+CIPAP_DEF=<ip>[,<gateway>,<netmask>]
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Response	+CIPAP_DEF.<ip> +CIPAP_DEF.<gateway> +CIPAP_DEF.<netmask> OK	OK
Parameters	• <ip>: string parameter, the IP address of the WizFi360 SoftAP. • [<gateway>]: gateway. • [<netmask>]: netmask.	
Notes	• The configuration changes will be saved in the flash • Currently, WizFi360 only supports class C IP addresses. • The Set Command interacts with DHCP-related AT commands (AT+CWDHCP-related commands). - If static IP is enabled, DHCP will be disabled; - If DHCP is enabled, static IP will be disabled; - Whether it is DHCP or static IP that is enabled depends on the last configuration.	
Example	AT+CIPAP_DEF="192.168.10.100","192.168.10.1","255.255.255.0"	

10.2.2.23. AT+CIPSTAMAC_CUR Sets the MAC Address of the WizFi360

Station Configuration Not Saved in the Flash

Commands	AT+CIPSTAMAC_CUR?	AT+CIPSTAMAC_CUR=<mac>
Response	+CIPSTAMAC_CUR.<mac> OK	OK
Parameters	• <mac>: string parameter, MAC address of the WizFi360 Station	
Notes	• The configuration changes will NOT be saved in the flash. • The MAC address of WizFi360 SoftAP is different from that of the WizFi360 Station. Please make sure that you do not set the same MAC address for both of them. • Bit 0 of the WizFi360 MAC address CANNOT be 1	
Example	AT+CIPSTAMAC_CUR="00:08:DC:36:00:0C"	

10.2.2.24. AT+CIPSTAMAC_DEF Sets the MAC Address of the WizFi360

Station; Configuration Saved in the Flash

Commands	AT+CIPSTAMAC_DEF?	AT+CIPSTAMAC_DEF=<mac>
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Response	+CIPSTAMAC_DEF.<mac> OK	OK
Parameters	<mac>.string parameter, MAC address of the WizFi360 Station	
Notes	- The MAC address of WizFi360 SoftAP is different from that of the WizFi360 Station. Please make sure that you do not set the same MAC address for both of them. - Bit 0 of the WizFi360 MAC address CANNOT be 1 - AT+CIPSTAMAC_DEF 撒塔 Station mac 80:00:00:00:00:00 ' 0 1 2 3 4 5 6 7 8 9 A B C D E F 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F AT+RESTORE 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F DŽ - WizFi360 0 Station 0 SoftAP 0 MAC 80:00:00:00:00:00 ' 0 1 2 3 4 5 6 7 8 9 A B C D E F 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 撒塔 0 ' 撒塔 0 SoftAP 0 MAC	
Example	AT+CIPSTAMAC_DEF="00:08:DC:36:00:0C"	

10.2.2.25. AT+CWSTARTSMART Starts SmartConfig

Commands	AT+CWSTARTSMART	
Response	OK	
Parameters	-	
Notes	- SmartConfig is only available in the WizFi360 Station mode - The message smart get wifi info means that SmartConfig has successfully acquired the AP information. WizFi360 will try to connect to the target AP - Message smartconfig connected wifi is printed if the connection is successful. Use command AT+CWSTOPSMART to stop SmartConfig before running other commands. Please make sure that you do not execute other commands during SmartConfig. - Starting from AT_v1.0, SmartConfig can get protocol type (AirKiss or ESP-TOUCH) automatically by command AT+CWSTARTSMART.	
Example	AT+CWMODE=1 AT+CWSTARTSMART	

10.2.2.26. AT+CWSTOPSMART Stops SmartConfig

Command	AT+CWSTOPSMART	
Response	OK	
Parameters	-	

Note	Irrespective of whether SmartConfig succeeds or not, before executing any other AT commands, please always call AT+CWSTOPSMART to release the internal memory taken up by SmartConfig
Example	AT+CWSTOPSMART

10.2.2.27. AT+CWAUTOCONN Auto-Connects to the AP or Not

Command	AT+CWAUTOCONN
Response	OK
Parameters	<enable>. -0: does NOT auto-connect to AP on power-up. -1: connects to AP automatically on power-up. The WizFi360 Station connects to the AP automatically on power-up by default
Example	AT+CWAUTOCONN=0

10.3 TCP/IP-Related AT Commands

10.3.1 Overview

No.	Command	Description
1	AT+CIPDOMAIN	DNS function
2	AT+CIPSTART	Establishes TCP connection, UDP transmission
3	AT+CIPSEND	Sends data
4	AT+CIPSENDEX	Sends data
5	AT+CIPCLOSE	Closes TCP/UDP connection
6	AT+CIFSR	Gets the local IP address
7	AT+CIPMUX	Configures the multiple connections mode
8	AT+CIPSERVER	Deletes/Creates a TCP server
9	AT+CIPMODE	Configures the transmission mode
10	AT+CIPSTO	Sets timeout when WizFi360 runs as TCP server
11	AT+PING	Ping
12	AT+CIUPDATE	Upgrades the software through network
13	AT+CIPDINFO	Shows remote IP and remote port with +IPD
14	+IPD	receives network data
15	AT+CIPSNTPCFG	Configures the time domain and SNTP server.
16	AT+CIPSNTPTIME	Queries the SNTP time.
17	AT+CIPDNS_CUR	Sets user-defined DNS servers; configuration not saved in the flash
18	AT+CIPDNS_DEF	Sets user-defined DNS servers; configuration saved in the flash

10.3.2 Commands

10.3.2.1. AT+CIPDOMAIN DNS Function

Command	AT+CIPDOMAIN=<domain name>
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Response	+CIPDOMAIN:<IP address> OK or DNS Fail ERROR
Parameter	<domain name>: the domain name, length should be less than 64 bytes.
Example	AT+CWMODE=1 AT+CWJAP="WIZnet","wiznet2018" AT+CIPDOMAIN="www.baidu.com"

10.3.2.2. AT+CIPSTART Establishes TCP Connection, UDP Transmission

TCP Connection:

Set Command	Single TCP connection (AT+CIPMUX=0): AT+CIPSTART=<type>,<remote IP>,<remote port>[,<TCP keep alive>]	Multiple TCP Connections (AT+CIPMUX=1): AT+CIPSTART=<link ID>,<type>,<remote IP>,<remote port>[,<TCP keep alive>]
Response	OK or ERROR If the TCP connection is already established, the response is: ALREADY CONNECTED	
Parameters	• <link ID> ID of network connection (0~4), used for multiple connections. • <type>: string parameter indicating the connection type: "TCP", "UDP" • <remote IP>: string parameter indicating the remote IP address. • <remote port>: the remote port number • [<TCP keep alive>]: detection time interval when TCP is kept alive; this function is disabled by default. ▶ 0: disable TCP keep-alive. ▶ 1 ~ 7200: detection time interval; unit: second (s).	
Examples	AT+CIPSTART="TCP","www.baidu.com",9527 AT+CIPSTART="TCP","192.168.4.2",1000	

UDP Transmission:

Set Command	Single connection (AT+CIPMUX=0): AT+CIPSTART=<type>,<remote IP>,<remote port>[,(<UDP local port>),(<UDP mode>)]	Multiple connections (AT+CIPMUX=1): AT+CIPSTART=<link ID>,<type>,<remote IP>,<remote port>[,(<UDP local port>),(<UDP mode>)]
Response	OK or	

	ERROR If the UDP transmission is already established, the response is: ALREADY CONNECTED
Parameters	• <linkID>: ID of network connection (0~4), used for multiple connections. • <type>: string parameter indicating the connection type: "TCP", "UDP" • <remoteIP>: string parameter indicating the remote IP address. • <remote port>: remote port number. • [<UDP local port>]: optional; UDP port of WizFi360. • [<UDP mode>]: optional. In the UDP transparent transmission, the value of this parameter has to be 0. ▶ 0: the destination peer entity of UDP will not change; this is the default setting.
Example	AT+CIPSTART="UDP","192.168.4.10",9527,9527,0

10.3.2.3. AT+CIPSEND

Commands	1. Single connection: (+CIPMUX=0) AT+CIPSEND=<length> 2. Multiple connections: (+CIPMUX=1) AT+CIPSEND=<link ID>,<length> 3. Remote IP and ports can be set in UDP transmission: AT+CIPSEND=[<link ID>,<length>[,<remoteIP>,<remote port>]] Function: to configure the data length in normal transmission mode.	AT+CIPSEND Function: to start sending data in transparent transmission mode
Response	Send data of designated length. Wrap return > after the Set Command. Begin receiving serial data. When data length defined by <length> is met, the transmission of data starts. If the connection cannot be established or gets disrupted during data transmission, the system returns: ERROR If data is transmitted successfully, the system returns: SENDOK	Wrap return > after executing this command. Enter transparent transmission, with a 20-ms interval between each packet, and a maximum of 2048 bytes per packet. When a single packet containing +++ is received, WizFi360 returns to normal command mode. Please wait for at least one second before sending the next AT command. This command can only be used in transparent transmission mode which requires single connection. For UDP transparent transmission, the value of <UDPmode> has to be 0 when using AT+CIPSTART.

Parameters	• <link ID>: ID of the connection (0~4), for multiple connections. • <length>: data length, MAX: 2048 bytes. • [<remote IP>]: remote IP can be set in UDP transmission. • [<remote port>]: remote port can be set in UDP transmission.	-
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10.3.2.4. AT+CIPSENDEX

Command	1. Single connection: (+CIPMUX=0) AT+CIPSENDEX=<length> 2. Multiple connections: (+CIPMUX=1) AT+CIPSENDEX=<linkID>,<length> 3. Remote IP and ports can be set in UDP transmission: 4. AT+CIPSENDEX=[<link ID>,<length>,<remote IP>,<remote port>] Function: to configure the data length in normal transmission mode	
Response	Send data of designated length Wrap return > after the Set Command. Begin receiving serial data. When the requirement of data length, determined by <length>, is met, or when \0 appears in the data, the transmission starts. If connection cannot be established or gets disconnected during transmission, the system returns: ERROR If data are successfully transmitted, the system returns: SENDOK	
Parameters	• <link ID>: ID of the connection (0~4), for multiple connections. • <length>: data length, MAX: 2048 bytes. • When the requirement of data length, determined by <length>, is met, or when \0 appears, the transmission of data starts. Go back to the normal command mode and wait for the next AT command. • When sending \0, please send it as \\0.	

10.3.2.5. AT+CIPCLOSE Closes the TCP/UDP Connection

Commands	AT+CIPCLOSE=<link ID>	AT+CIPCLOSE
Response	OK	
Parameters	<linkID>: ID of the connection to be closed. When ID is 5, all connections	-

	will be closed. (In server mode, the ID 5 has no effect.)	
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10.3.2.6. AT+CIFSR Gets the Local IP Address

Execute Command	AT+CIFSR
Response	+CIFSR:APIP,<SoftAP IP address> +CIFSR:APMAC,<SoftAP MAC address> +CIFSR:STAIP,<Station IP address> +CIFSR:STAMAC,<Station MAC address> OK
Parameters	<IP address> WizFi360 SoftAP ip address WizFi360 Station ip address <MAC address> WizFi360 SoftAP mac address WizFi360 Station mac address
Notes	Station IP!MAC address' DŽ

10.3.2.7. AT+CIPMUX Enable or Disable Multiple Connections

Commands	AT+CIPMUX?	AT+CIPMUX=<mode>
Response	+CIPMUX:<mode> OK	OK
Parameters	<mode>: ▶ 0: single connection ▶ 1: multiple connections	
Notes	- The default mode is single connection mode. - Multiple connections can only be set when transparent transmission is disabled (AT+CIPMODE=0). - This mode can only be changed after all connections are disconnected. - If the TCP server is running, it must be deleted (AT+CIPSERVER=0) before the single connection mode is activated.	
Example	AT+CIPMUX=1	

10.3.2.8. AT+CIPSERVER Deletes/Creates TCP Server

Set Command	AT+CIPSERVER=<mode>[,<port>]
Response	OK
Parameters	<mode>: 0: deletes server. 1: creates server. <port>: port number; 5000 by default.
Notes	- A TCP server can only be created when multiple connections are activated (AT+CIPMUX=1) - A server monitor will automatically be created when the TCP server is created. - When a client is connected to the server, it will take up one connection and be assigned an ID.
Example	AT+CIPMUX=1 AT+CIPSERVER=1,1001

10.3.2.9. AT+CIPMODE Sets Transmission Mode

Commands	AT+CIPMODE?	AT+CIPMODE=<mode>
Response	+CIPMODE:<mode> OK	OK
Parameters	<mode>: 0:normal transmission mode 1.UART-Wi-Fi passthrough mode (transparent transmission), which can only be enabled in TCP single connection mode or in UDP mode when the remote IP and port do not change.	
Notes	- The configuration changes will NOT be saved in flash. - During the UART-Wi-Fi passthrough transmission, if the TCP connection breaks, WizFi360 will keep trying to reconnect until +++ is input to exit the transmission. If it is a normal TCP transmission and the TCP connection breaks, WizFi360 will give a prompt and will not attempt to reconnectDŽ	
Example	AT+CIPMODE=1	

10.3.2.10. AT+CIPSTO Sets the TCP Server Timeout

Commands	AT+CIPSTO?	AT+CIPSTO=<time>
Response	+CIPSTO:<time> OK	OK
Parameter	<time>: TCP server timeout within the range of 0 ~ 7200s	

Notes	- WizFi360 configured as a TCP server will disconnect from the TCP client that does not communicate with it until timeout. - If AT+CIPSTO=0, the connection will never time out. This configuration is not recommended
Example	AT+CIPMUX=1 AT+CIPSERVER=1,1001 AT+CIPSTO=10

10.3.2.11. AT+PING Ping Packets

Command	AT+PING=<ip>
Response	+<time> > OK or ERROR
Parameters	<ip>:string; host IP or domain name <time>:the response time of ping
Notes	AT+PING="192.168.4.1" AT+PING="www.baidu.com"

10.3.2.12. AT+CIUPDATE Updates the Software Through Wi-Fi

Command	AT+CIUPDATE
Response	OK

10.3.2.13. AT+CIPDINFO Shows the Remote IP and Port with +IPD

Command	AT+CIPDINFO=<mode>
Response	OK
Parameters	<mode>: 0 or 1 ▶ 0: does not show the remote IP and port with +IPD ▶ 1: shows the remote IP and port with +IPD.
Example	AT+CIPDINFO=1

10.3.2.14. +IPD Receives Network Data

Command	(+CIPMUX=0)+IPD,<len>[,<remote IP>,<remote port>]:<data> (+CIPMUX=1)+IPD,<link ID>,<len>[,<remote IP>,<remote port>]:<data>
----------------	--

Parameters	The command is valid in normal command mode. When the module receives network data, it will send the data through the serial port using the +IPD command. [<remoteIP>].remote IP, enabled by command AT+CIPDINFO=1. [<remoteport>].remote port, enabled by command AT+CIPDINFO=1. <linkID>.ID number of connection. <len>.data length. <data>.data received.
-------------------	---

10.3.2.15. AT+CIPSNTPCFG Sets the Configuration of SNTP

Commands	AT+CIPSNTPCFG?	AT+CIPSNTPCFG= [<SNTP server0>,<SNTP server1>,<SNTP server2>]
Response	+CIPSNTPCFG:<SNTP server0>[,<SNTP server1>,<SNTP server2>] OK	OK
Parameters	<SNTP server0>.optional parameter indicating the first SNTP server; <SNTP server1>.optional parameter indicating the second SNTP server; <SNTP server2>.optional parameter indicating the third SNTP server.	
Note	If the <SNTP server> parameters are not set, servers "cn.ntp.org.cn", "ntp.sjtu.edu.cn", and "us.pool.ntp.org" will be used by default.	
Example	AT+CIPSNTPCFG="cn.ntp.org.cn","ntp.sjtu.edu.cn","us.pool.ntp.org"	

10.3.2.16. AT+CIPSNTPTIME Checks the SNTP Time

Query Command	AT+CIPSNTPTIME?
Response	+CIPSNTPTIME:<time> OK
Parameters	<time>.SNTP time For example. +CIPSNTPTIME:Wed Sep 19 17:58:34 2018
Example	AT+CWMODE=1 // set as station mode AT+CWJAP="WIZnet","wiznet2018" // connect to router,access the internet AT+CIPSNTPTIME? // get time

10.3.2.17. AT+CIPDNS_CUR Sets User-defined DNS Servers; Configuration Not

Saved in the Flash

Commands	AT+CIPDNS_CUR?	AT+CIPDNS_CUR=<enable>[,<DNS server0>'<DNS server1>]
Response	[+CIPDNS_CUR:<DNS server0>] [+CIPDNS_CUR:<DNS server1>] OK	OK
Parameters	• <enable>. ▶ 0.disable to use user-defined DNS servers; ▶ 1.enable to use user-defined DNS servers • <DNSserver0>.optional parameter indicating the first DNS server; • <DNSserver1>.optional parameter indicating the second DNS serve	
Note	• For command: AT+CIPDNS_CUR=0 (disable to use user-defined DNS servers), "208.67.222.222" will be used as DNS server by default. And the DNS server may change according to the configuration of the router which the chip connected to. • For command: AT+CIPDNS_CUR=1 (enable to use user-defined DNS servers, but the <DNS server> parameters are not set), servers "208.67.222.222" will be used as DNS server by default.	
Example	AT+CIPDNS_CUR=1 ""8.8.8.8"	

10.3.2.18. AT+CIPDNS_DEF Sets User-defined DNS Servers; Configuration

Saved in the Flash

Commands	AT+CIPDNS_DEF?	AT+CIPDNS_DEF=<enable>[,<DNS server0>'<DNS server1>]
Response	[+CIPDNS_DEF:<DNS server0>] [+CIPDNS_DEF:<DNS server1>] OK	OK
Parameters	• <enable>. ▶ 0.disable to use a user-defined DNS server; ▶ 1.enable to use a user-defined DNS server. • <DNSserver0>.optional parameter indicating the first DNS server; • <DNSserver1>.optional parameter indicating the second DNS serve.	
Note	• For command: AT+CIPDNS_DEF=0 (disable to use user-defined DNS servers), "208.67.222.222" will be used as DNS server by default. And the DNS server may change according to the configuration of the router which the chip connected to. • For command: AT+CIPDNS_DEF=1 (enable to use user-defined DNS servers, but the <DNS server> parameters are not set), servers "208.67.222.222" will be used as DNS server by default.	

Example

```
AT+CIPDNS_DEF=1""8.8.8.8"
```




11. AT command configuration example

11.1 WizFi 360 Sets up TCP Connection as Station

```
AT\r\n                                \\Tests AT Startup
OK\r\n
ATE0\r\n                             \\ Echo Off
OK\r\n
AT+CWMODE=1\r\n                       \\ Set WizFi360 to station
OK\r\n
AT+CWDHCP=0,1\r\n                     \\Set WizFi360 to station and open DHCP
OK\r\n
AT+CWLAP="wiznetsz","wiznetsz"\r\n  \\ Connects to an AP
OK\r\n
```

12. &RQWDFW XV

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Single Module

FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device.

FCC Radiation Exposure Statement

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following:
"Contains Transmitter Module FCC ID: 2ATUB-WIZFI360PA Or Contains FCC ID:
2ATUB-WIZFI360PA"

When the module is installed inside another device, the user manual of the host must contain below warning statements;

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

Any company of the host device which install this modular with Single modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C : 15.247 and 15.209 requirement, Only if the test result comply with FCC part 15C : 15.247 and 15.209 requirement, then the host can be sold legally.

Regulatory notice to host manufacturer according to KDB 996369 D03 OEM Manual

Modular Approval Statement

Regulatory notice to host manufacturer according to KDB 996369 D03 OEM Manual. This module has been granted modular approval as below listed FCC rule parts.

- FCC : Part 15.247

Summarize the specific operational use conditions

The OEM integrator should use equivalent antennas which is the same type and equal or less gain than an antenna listed below this instruction manual.

Antennas list

The antenna certified with this module is listed following.

Model Name	Antenna type	Gain (dBi)
WizFi360-PA	PCB antenna	2
WizFi360-CON	External Antenna (WizFi360-CON)	3.5
WizFi360-CON	FXP710.07.0053A	3.734

A host manufacturer must not use the other types of antenna and an antenna with a gain that exceeds the values listed in this documents.

RF exposure considerations

-The module has been certified for integration into products only by OEM integrators under the following condition:

-The antenna(s) must be installed such that a minimum separation distance of at least **20cm** is maintained between the radiator (antenna) and all persons at all times.

-The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

- Mobile use

As long as the three conditions above are met, further transmitter testing will not be required.

OEM integrators should provide the minimum separation distance to end users in their end-product manuals.

End Product Labeling

The module is labeled with its own FCC ID. If the FCC ID are not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

Contains FCC ID: 2ATUB-WIZFI360PA

Information on test modes and additional testing requirements

OEM integrator should evaluate the final product with this module installed in a host to ensure FCC compliance. If the final product has any additional transmitters and those transmitter can be operating simultaneously, the simultaneous transmission mode should be evaluated to make sure there is no any additional emission generated during the operation of all transmitters.

Additional testing, Part 15 Subpart B disclaimer

The final host product also requires Part 15 subpart B compliance testing with the modular transmitter installed to be properly authorized for operation as a Part 15 digital device.

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module or change RF related parameters in the user manual of the end product.

Note EMI Considerations

Note that a host manufacture is recommended to use D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional noncompliant limits due to module placement to host components or properties. For standalone mode, reference the guidance in D04 Module Integration Guide and for simultaneous mode; see D02 Module Q&A Question 12, which permits the host manufacturer to confirm compliance.