Model: UT-9061
(WiFi Transfer RS-232/485/422)

Product Operating Instructions

Contents

I. Product Characteristics

- Communication Interface: RS-232, RS-485, RS-422
- Protection grade: RS-232 interface, 600W surge protection
  RS-485/422 interface, 3KA lighting protection of each wire
  2KA lighting protection at power source interface
- Supply voltage: 9-30VDC
- Working current: 9V@200mA
- Standard transmission rate: 300~115200bps
- Working mode: optical transceiver, asynchronous half duplex and asynchronous full duplex.
- Antenna impedance: 50Ω (standard configuration is 360°rotation and 90°folding. SMA splice antenna)
- Working temperature: -40℃~ +85℃
- Overall dimension: 97mm×65mm×26mm (excluding antenna)
- Support 802.11b/g/n wireless standard
- Support wireless work in STA/AP/AP+STA mode
- External antenna
- Provide AT+ command set configuration
- Provide Web configuration page
- Support heartbeat signal, WIFI connection indication
- Support ex-factory parameters customization settings

II. Connector and Signals:

RS-232C pin distribution

DB9 male head/hole pattern (PIN)	RS-232C interface signal
2	Receive data SIN (RXD)
3	Send data SOUT (TXD)
5	Signal ground GND
1,4,6,7,8,9	Empty

RS-485/RS-422 output signal and terminal blocks pin distribution

Binding post	Output signal	RS-422 full duplex wiring	RS-485 half duplex wiring
1	T/R+	Send (A+)	RS-485 (A+)
2	T/R-	Send (B-)	RS-485 (B-)
3	RXD+	Receive (A+)	Empty
4	RXD-	Receive (B-)	Empty

III. Hardware Installation and Application:

Before installing UT-9061 interface converter, please carefully read product specification and insert the antennas matched with the product into WiFi marked place and connect power converter into socket. This product applies DB-9/binding post general connector as its output interface. It can automatically realize RS232/RS-485 or RS-422 communication mode without jumper settings. The twisted-pair or shielded wire can be used, so both connection and dismantling are very convenient. T/R+T/R- stands for sending and receiving A+/B-,

RXD+/RXD- stands for receiving A+/B- and VCC stands for input or output power supply. GND stands for common ground wire, point to point, point to multi-point and half duplex communication connect with two wires which are T/R+ and T/R-; point to point, point to multi-point and full duplex communication connect with four wires which are T/R+, T/R-, RXD+ and RXD-. TXD stands for sending and RXD for receiving.

UT-9061 interface converter supports the following four communication modes:

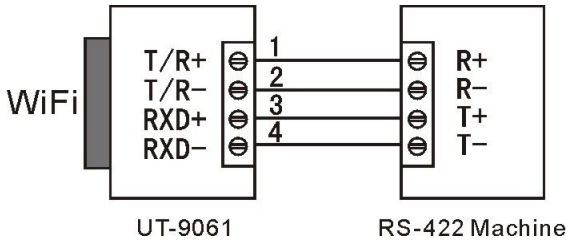
1. point to point/four wires full duplex
2. point to multi-point/ four wires full duplex
3. point to point/ two wires half duplex
4. point to multi-point/two wires half duplex

When the converter is used as full duplex or half duplex for wiring, in order to prevent signal reflection and interference, a matched resistance (parameter: 120Ω1/4W) should be installed at line terminal.

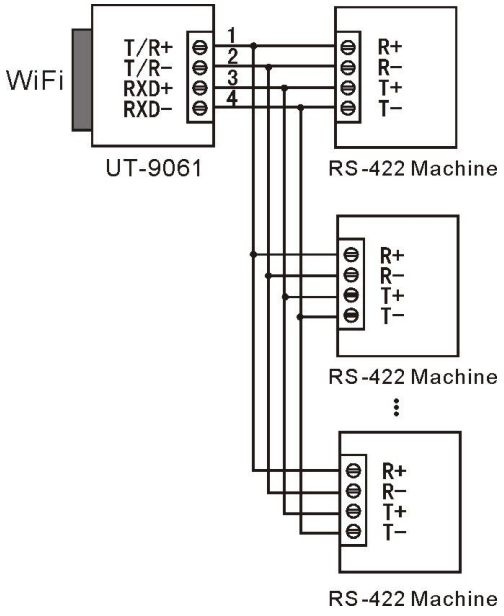
IV. Communication Connection Diagram

WiFi to RS-422 transfer

1. RS-422 point to point/four-wire full duplex communication

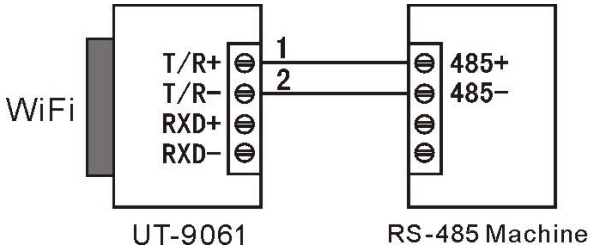


2. RS-422 point to multi-point/four-wire full duplex

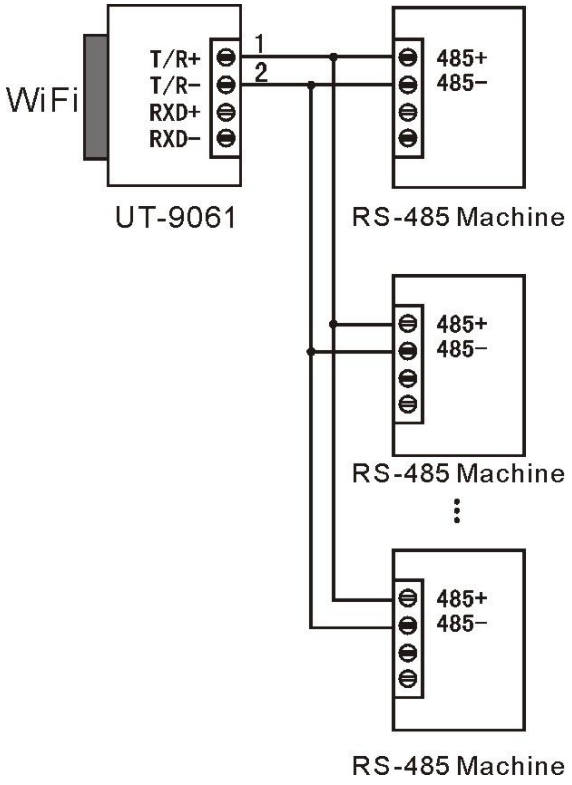


WiFi to RS-485 transfer

1. RS-485 point to point/two-wire half duplex

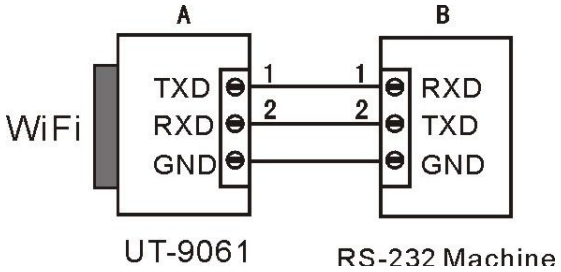


2. RS-485 point to multi-point/two-wire half duplex



WiFi to RS-232 transfer

1. UT-9061 interface converter RS-232 communication



V. UT-9061 Basic Parameters

UT-9061 Basic Parameters		
	Items	Index
Wireless parameters	Standard certification	FCC/CE
	Wireless standard	802.11 b/g/n
	Frequency range	2.412GHz-2.484GHz
	Transmission power	802.11b: +20dBm(Max.)
		802.11g: +18dBm(Max.)
		802.11n: +15dBm(Max.)
		The user may configure power
	Receiving sensitivity	802.11b: -89dBm
		802.11g: -81dBm
		802.11n: -71dBm
	Antenna option	External: 4.5 dBm antenna
Hardware parameters	Working voltage	DC9- 30V (+/-5%)
	Working current	170mA~300mA
	Working temperature	-40℃ - 85℃
	Storage temperature	-55℃ - 110℃
	Dimension	97mm×65mm×26mm (excluding antenna)
Software parameters	Wireless network type	STA/AP/AP+STA mode
	Safety mechanism	WEP/WPA-PSK/WPA2-PSK/WAPI
	Encryption type	WEP64/WEP128/TKIP/AES
	Working mode	Transparent transmission mode
	Serial port command	AT+ command structure
	User configuration	Web server＋AT command configuration

VI. Interface Description

UT-9061 interface description

Function	**Name**	**Description**
External interface	DC-Jack	9~30V@1A power supply input: DC-Jack
	ATT	2.4GHz, SMA external antenna port
	COM UART	DB9M, UART port, used to connect serial port equipment
	COM UART	4PIN terminal, RS-485/422 port
LED light	Power (Red)	Power light
	nLink	WiFi connection indicating light (normal on stands for WiFi connection successful)
	nReady	Working mode indicating light (normal on stands for start completion)
	TXD	UART send indicating light
	RXD	UART receive indicating light
Button	Reset	Reset button
	Reload	Recover ex-factory settings button（Hold down for 3 seconds after the release）

VII. Function Description

7.1 Wireless network

The wireless module of UT-9061 can not only be configured into a wireless STA, but also can be configured into AP. Logically UT-9061 support 2 wireless ports, namely one used to be STA and the other used to be one AP. Other STA can connect wireless network through the AP port of this module. UT-9061can provide very flexible networking mode and network topology. The function module of UT-9061 is as follows:

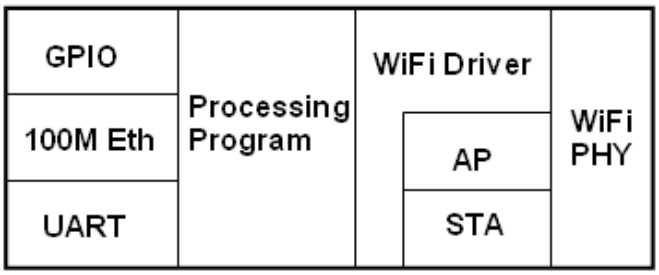


Fig.-1 UT-9061 Function Structure

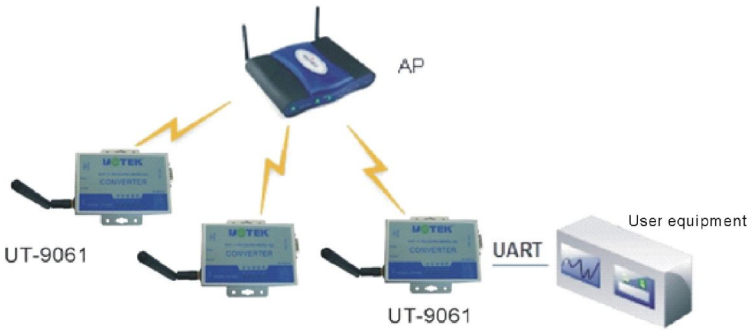
<Notes>:

AP: namely wireless access point, is a central node for wireless network. The commonly used wireless route is an AP and other wireless terminals can be connected via AP.

STA: namely wireless station point, is an terminal of wireless network, such as laptop and PDA, etc.

7.2 Wireless network based on AP

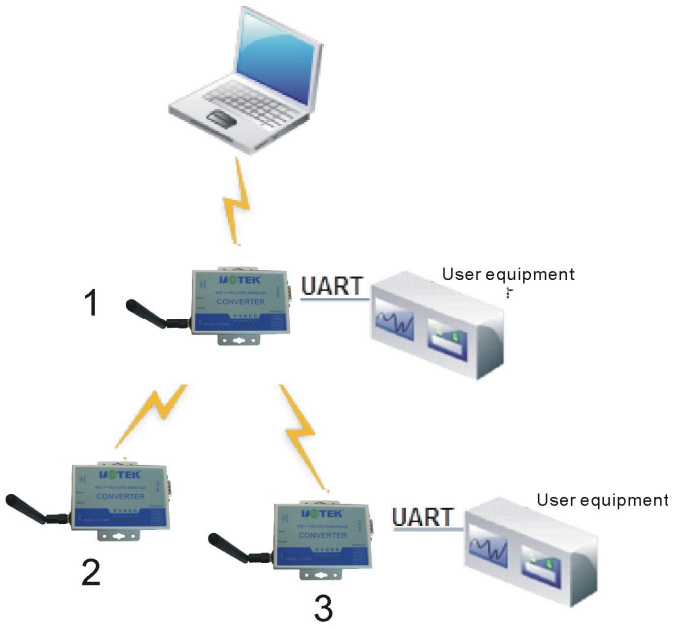
UT-9061 is connected to other AP as STA (making use of AP CLI port) to form a wireless network. AP is used to be the center of wireless network for all the STA. The mutual communications among STA are completed by AP transmission as indicated below:



UT-9061 Basic Networking

7.3 Wireless network based on Ad-Hoc network

Since UT-9061 can be set not only as AP, but also as STA, the wireless network for Ad-Hoc network can be realized easily as indicated below. UT-9061 of No. (1) in the pictures is used as AP and other modules and computers can be connected to this module as STA or it may connect to user equipment via UART or GPIO port as well; UT-9061 of No. (2) and (3) in the pictures is used as STA to connect module (1), so all the UT-9061 modules can be managed by computers. With Ad-Hoc network mode, it's convenient for uniform management to all the UT-9061 modules and easily expanding the coverage area of the entire wireless network.



UT-9061 Ad-Hoc network

7.4 Automatic frequency-selecting function

When the module is working in STA mode, the module will automatically adjust the wireless channel as AP according to its wireless channel.

When the module is working in AP mode, it can be set as automatic frequency-selecting mode. When the module starts, a proper wireless channel will be selected according to ambient environment.

7.5 Safety mechanism

UT-9061 module supports multiple wireless network encryption approaches which can sufficiently ensure safe transmission of data, including:

WEP

WPA-PSK/TKIP

WPA-PSK/AES

WPA2-PSK/TKIP

WPA2-PSK/AES

VIII. UART Automatic Framing Function

8.1 UART automatic framing mode

When the module receives data from UART, it will check the interval time of 2 adjacent bytes. If the interval time is greater than a certain value, then the frame is considered to be finished, otherwise receive data all the time until the data is more than 4K bytes. When the module determines that the previous frame of serial port is over, the module will transmit it to WIFI interface.

The default interval time between 2 bytes by the module is 50ms, i.e. when the interval time is more than 50ms, one frame is over.

Besides, the interval time can be set to be 10ms by commands to satisfy the customers' requirements for transmission efficiency of serial port. By testing, when the setting is 10ms, the loop of WIFI → UART → WIFI, if the data is not large, the delay is about 40～50ms.

But if the time interval is 10ms, the customer's MCU can't ensure the next byte will be sent within 10ms, and then the serial port data may be disunited.

The interval time can be set by AT command, AT+FUARTTE=fash/normal. Fast corresponds to 10 ms and normal corresponds to 50ms. This command is ex-factory settings command. AT+RELD is invalid to it.

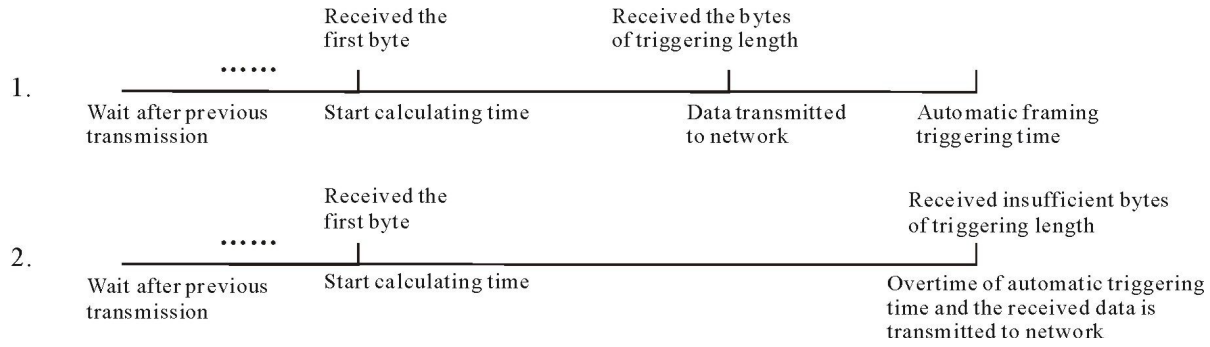
8.2 UART automatic framing mode

For the data frame in fixed length of serial port, the UART automatic framing function can be started to achieve highest transmission efficiency. UT-9061 module supports UART port automatic framing function. Start this function by settings and set automatic framing triggering time and triggering frame length, the module will automatically constitute the received data from serial port into frames and transmit them to network.

Automatic framing triggering frame length: when the module receives specified bytes from serial port, it will constitute them into data frame and transmit to network.

Automatic framing triggering frame time: if the received data from serial port is not sufficient to automatically constitute framing triggering frame length within triggering time, the module will transmit the received data to network.

The automatic framing time is calculated from the first received byte from serial port by module, as indicated below:



Automatic Framing Function Diagram

For the detailed UART automatic framing operations, please refer to "AT Commend Set" UARTF/UARTFT/UARTFL command instructions

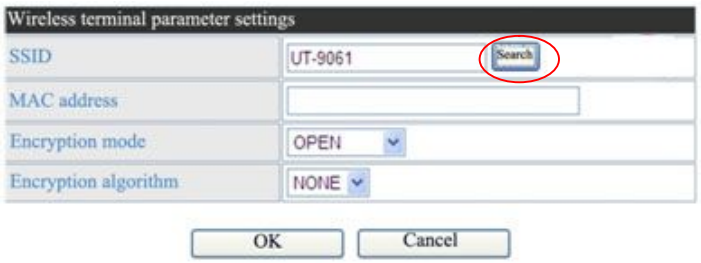
8.3 Address binding

UT-9061 module supports BSSID function which binds target network in the process of networking (used as STA to connect AP). According to the stipulations of 802.11 agreement, different wireless networks may have the same network names (i.e. SSID/ESSID), but a sole BSSID address must be corresponded (i.e. MAC address).

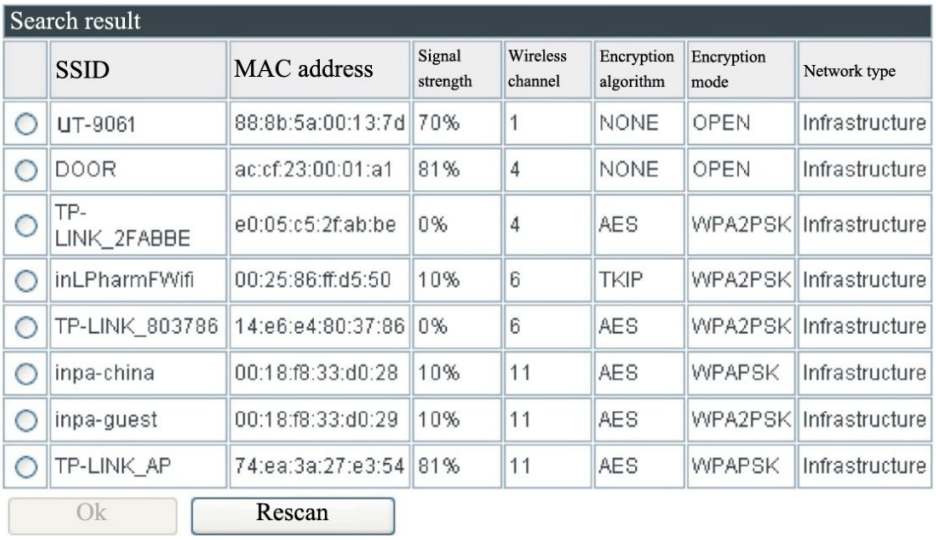
The illegal invader can connect the STA in network to illegal AP by establishing the same SSID/ESSID wireless network so as to achieve network leak. By binding BSSID address, the STA can be prevented to connect illegal network and improve the safety of wireless network.

8.4 Search function in STA settings

In the page of "wireless terminal settings" of the module, "Search" button is added. Click this button to pop up a window where displays information of ambient AP and select it. As indicated below:



Search Button in STA Settings



Search Interface in STA Settings

8.5 Working mode

UT-9061 module supports two working modes: transparent transmission mode and agreement transmission mode. The transparent transmission mode can realize serial point plug and play so as to reduce the complexity for user operation in maximum degree. The agreement transmission mode may realize precise transmission of user data. The user may set different working modes as per actual requirements and save in Flash. After electrifying and starting, the module will enter such working mode.

UT-9061 module will automatically connect wireless network and server according to the preset parameters by the user and start the set working mode and open the serial port as per the preset serial port parameters.

The parameters needed to be preset by the user are:

Wireless network parameters

SSID

Safety mode

Secret key

Serial port parameters

Baud rate

Data bit

Check bit

Stop bit

Hardware flow control

Working mode

Transparent transmission or agreement transmission mode

As indicate below, making use of the transparent transmission function of UT-9061, the user can regard UT-9061 module as a virtual serial port line and then send and receive data according to ordinary serial port mode, that is, the original serial port equipment of the user. The user can directly replace the connected serial port lines into cost module and realize wireless data transmission without any modification.

UT-9061 Transparent Transmission Display

8.6 Parameter settings

UT-9061 module supports parameter settings of web mode. The user can use IE browser to set conveniently. If the module has been connected to some wireless network, settings can be made only the PC machine is connected to the same wireless network. Besides, UT-9061 is an AP as well; the PC can be set by connecting to the modules needed to be set.

UT-9061 module supports AT+ command of serial port. Please refer to the chapter of “AT Command Instructions” file.

<Notes>:

UTEK can make ex-factory default configuration according to the users’ customization parameter settings which will greatly reduce the configuration time of MP modules. At the same time, if the user needs to set different parameters for each module or to configure modules in batches, UTEK can provide batch configuration tool to promote configuration efficiency for the user. Please contact the technicians of UTEK to obtain further batch configuration support.

8.7 Firmware upgrading

UT-9061 supports online firmware upgrading in web mode.

IX. Settings and Usage

Web management page

Some configurations need to be made in the modules when you use UT-9061 module for the first time. You may make configurations with web management page via PC connecting WiFi of UT-9061.

In default case, the SSID of UT-9061 AP interface is UT-9061. The IP address, user name and password is as follows: UT-9061 network default settings table

Parameters	Default Settings
SSID	UT-9061
IP address	10.10.100.254
Subnet mask	255.255.255.0
User name	admin
Password	admin

9.2 Open management page

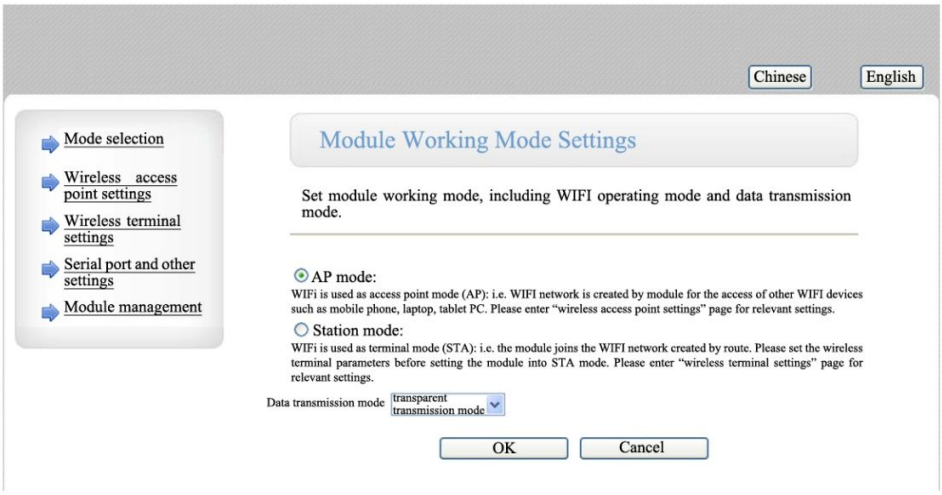
Firstly connect UT-9061 with the WLAN card of PC. The SSID is UT-9061. After connecting, open IE and input **http://192.168.1.254** in the address bar and then press enter. Fill in the user name and password in the pop-up dialog box and then press “OK”.

Second step of opening management page

And then the management page of UT-9061 will present. The management page of UT-9061 supports Chinese and English which can be set at the top right corner. There are five pages, i.e. “Wireless mode selection” “Wireless access point settings” “Wireless terminal port settings” “Apps settings” “Module management”.

9.3 Module selection

You may set and select the module working in AP mode or STA mode on the first Web page.



Wireless Mode Settings

9.4 Wireless access point settings

UT-9061 supports AP interface by which you can manage the module conveniently and realize Ad-Hoc networking. The management page is as below, including: SSID settings, wireless network mode settings and wireless safety settings and LAN settings constituted by AP.

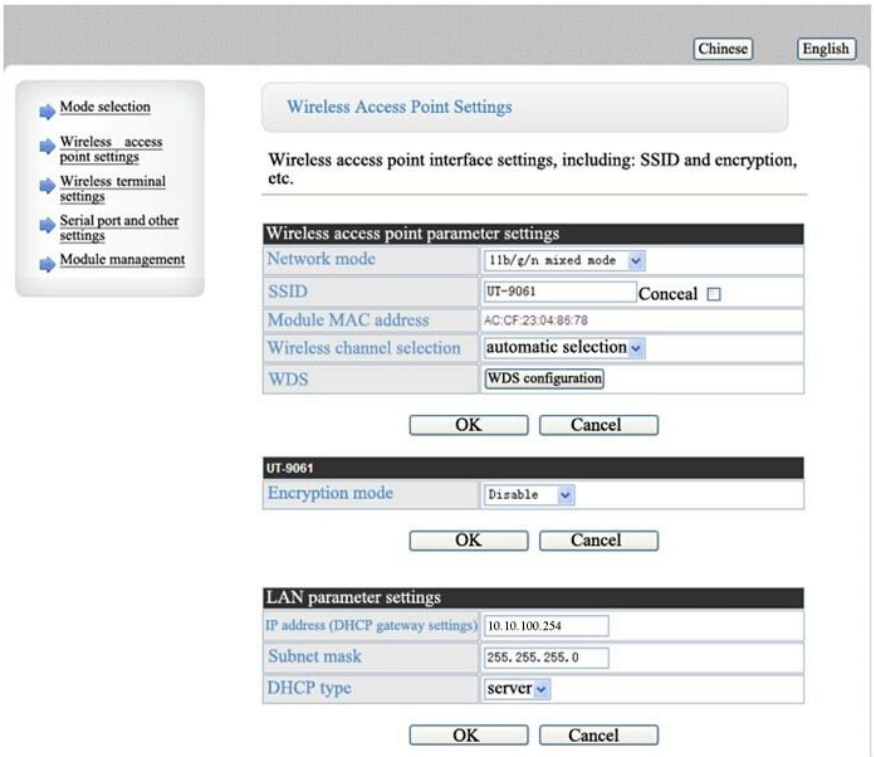
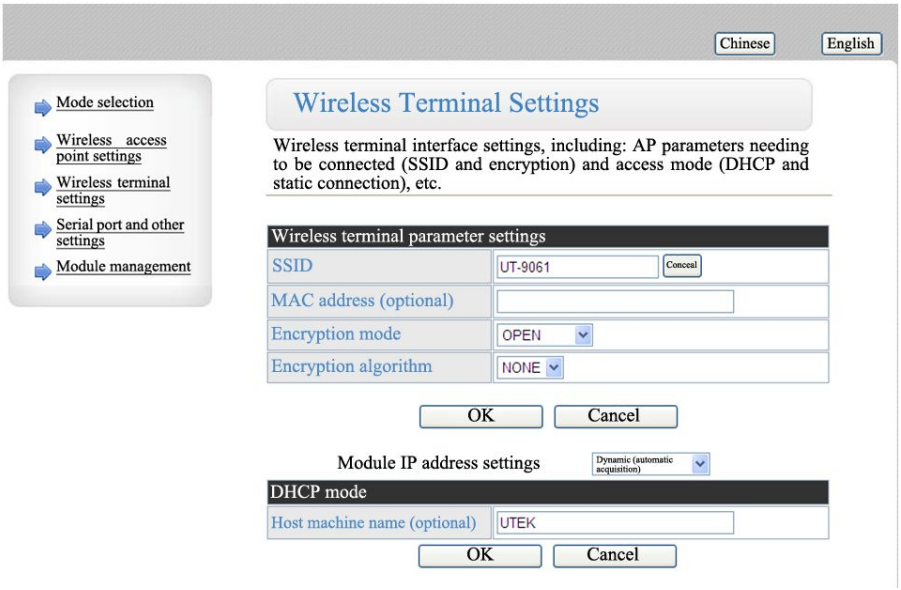


Figure -2 Wireless Access Point Settings

9.5 Wireless terminal settings

Wireless terminal interface, i.e. STA interface. UT-9061 may connect to other wireless networks via STA access. The settings are as follows:

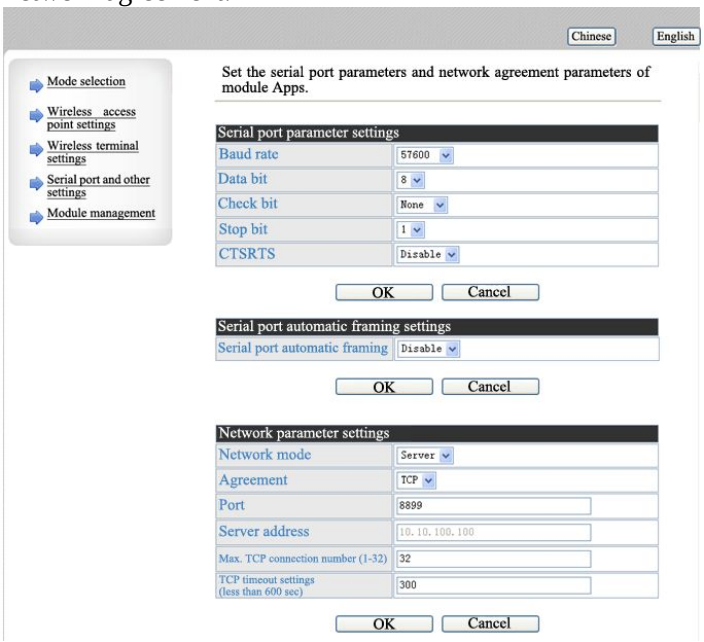
The settings in this page contain two charts. The above one is STA wireless settings, including SSID needing to connect AP and safety settings, etc. The below chart is about network connection mode settings, including DHCP and static connection mode.



Wireless Terminal Interface Settings

9.6 Serial port and other settings

The Apps settings is the settings of wifi transferring to uart application parameters, including: settings of serial port parameters and network agreement.



Apps Settings

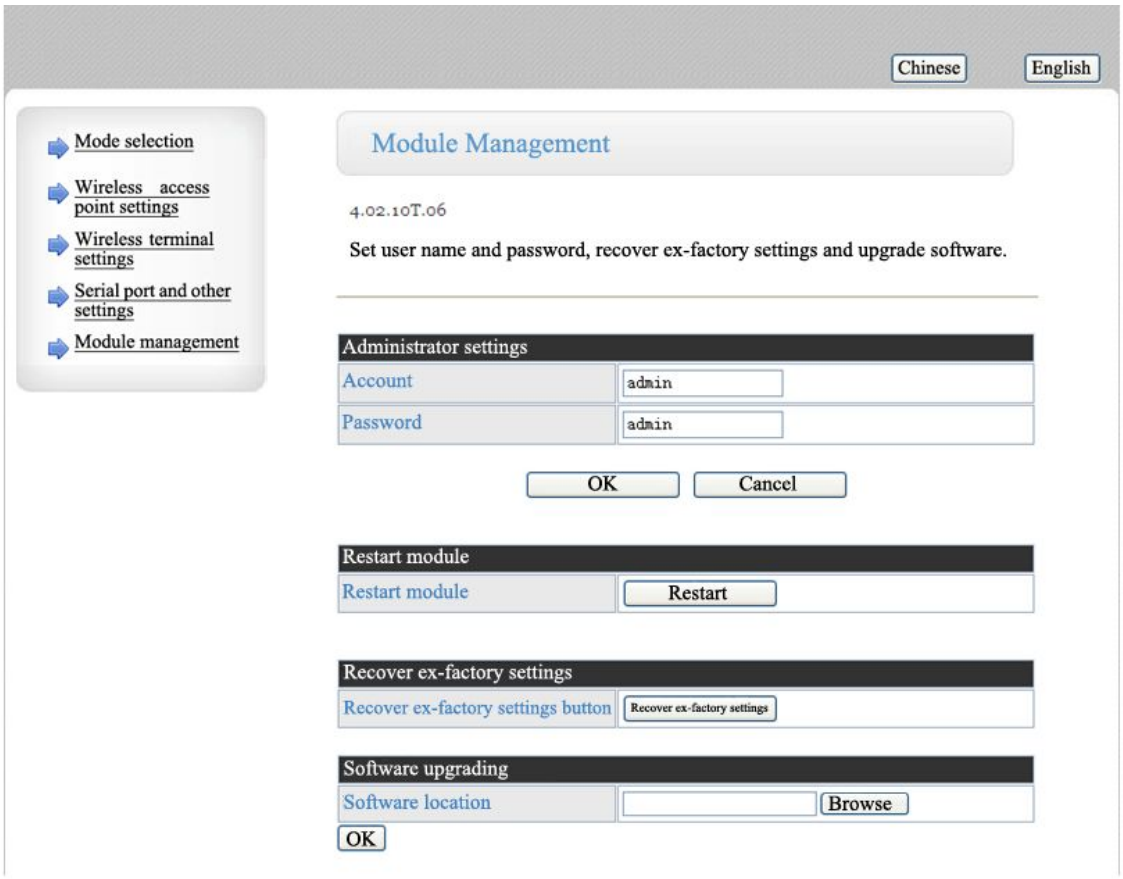
<Notes>:

The network side can be set into 3 modes: TCP Server, TCP Client, UDP.

Since UDP has no connection, there is no Server or Client. If the setting is TCP Server, it doesn't need to input IP address. For other settings, the opposite terminal IP address needing to be connected should be input at IP address bar. Put the agreement port number at the port column. The port number at the two ends of communication must be the same.

9.7 **Module management page**

Module management contains user name/password settings, recovering ex-factory settings and software upgrading function.



Module Management Page

<Notes>:

"Restart module" button: when the user set parameters in different pages, click "OK" to confirm the set parameters. But these settings can be effective only after the user click "restart" module management page. After "restarting" is clicked, the module will restart and refresh the original configuration information in internal storage.

Debugger

In order to facilitate introduction, we use 2 general programs as debuggers:

One is serial port debugger, ComTools. ComTools.exe

Another is internet access debugger, TCPUDPDbg. tcpudpdbg.exe TCPUDPDbg Micros

9.9 Network **connection**

2 kinds of connection mode can be used in debugging. The user can test as per actual applications:

Use STA interface, UT-9061 and one PC connect with a wireless AP respectively and another PC connect with UT-9061 by serial port, as indicated below:

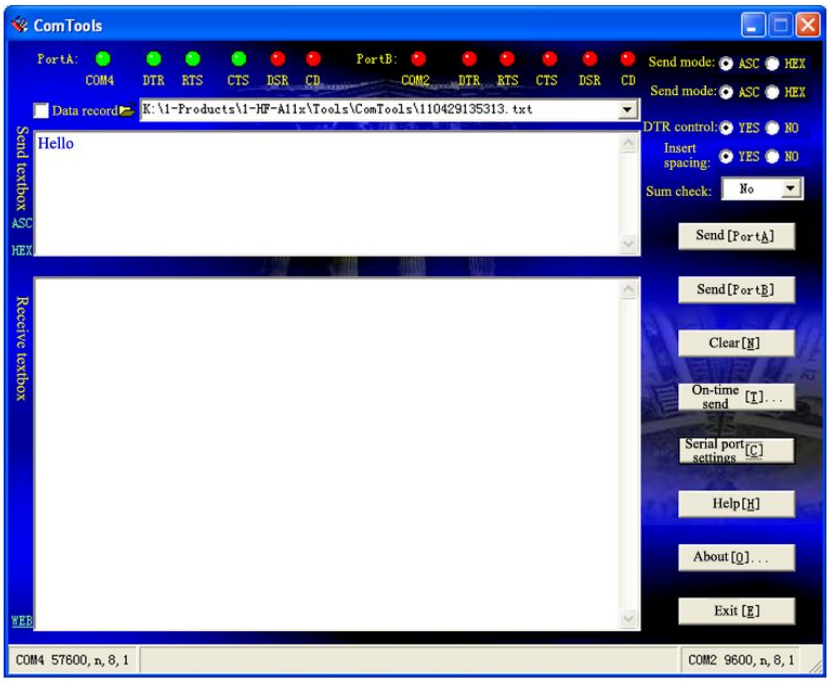
STA Interface Connection Commissioning

Use AP interface, a PC connect with the AP interface of UT-9061 and another PC connect with UT-9061 by serial port, as indicated below:

AP Interface Connection Commissioning

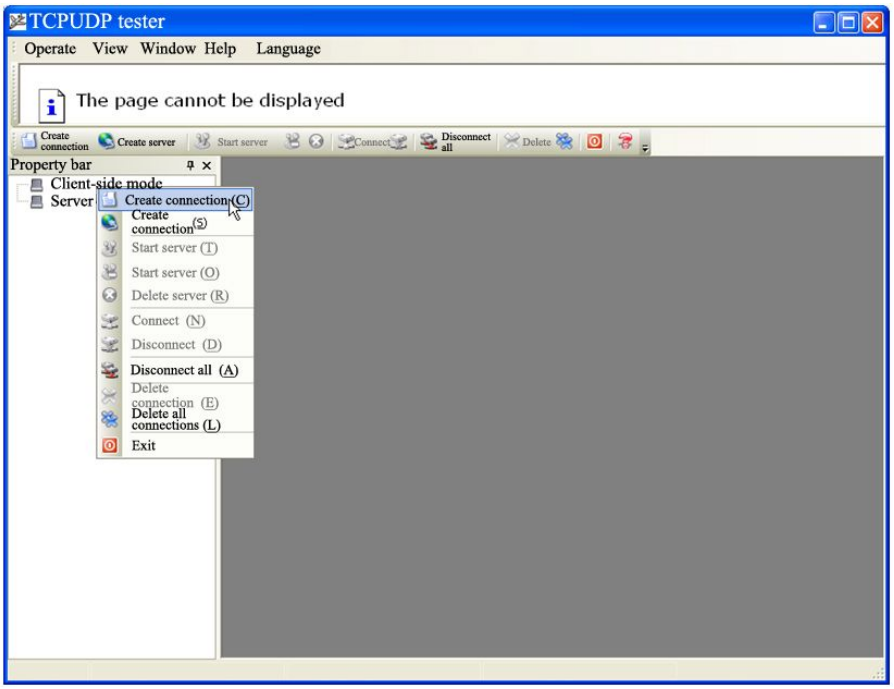
9.10 Debugging module

As shown above, open CommTools program in PC1 and set COM port and open serial port connection.



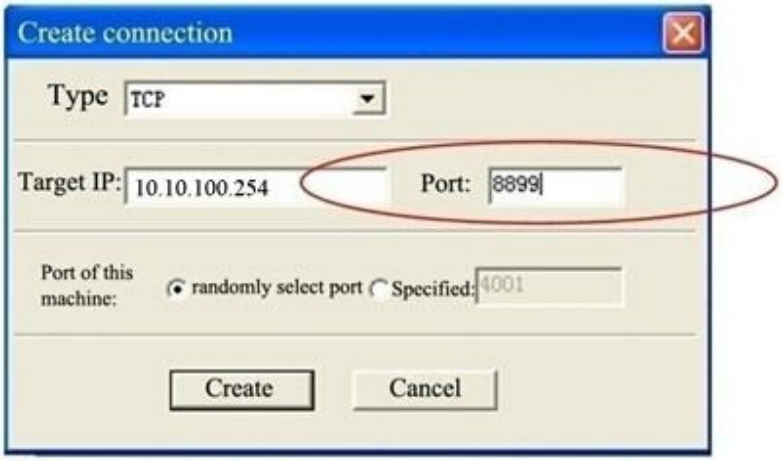
CommTools debugger

Open TCPUDPDbg program in PC2. Set the parameters of the page according to the previous applications and create a connection. If the UT-9061 is set to be Server mode, then the client-side connection should be created, otherwise the server mode connection should be created.



Create Connection by TCPUDPDbg Tool

And then select TCP/UDP, agreement port and IP address according to the parameters of the settings page of Apps.



TCPUDPDbg Tool Parameter Settings

And then continue to click for creating connection.

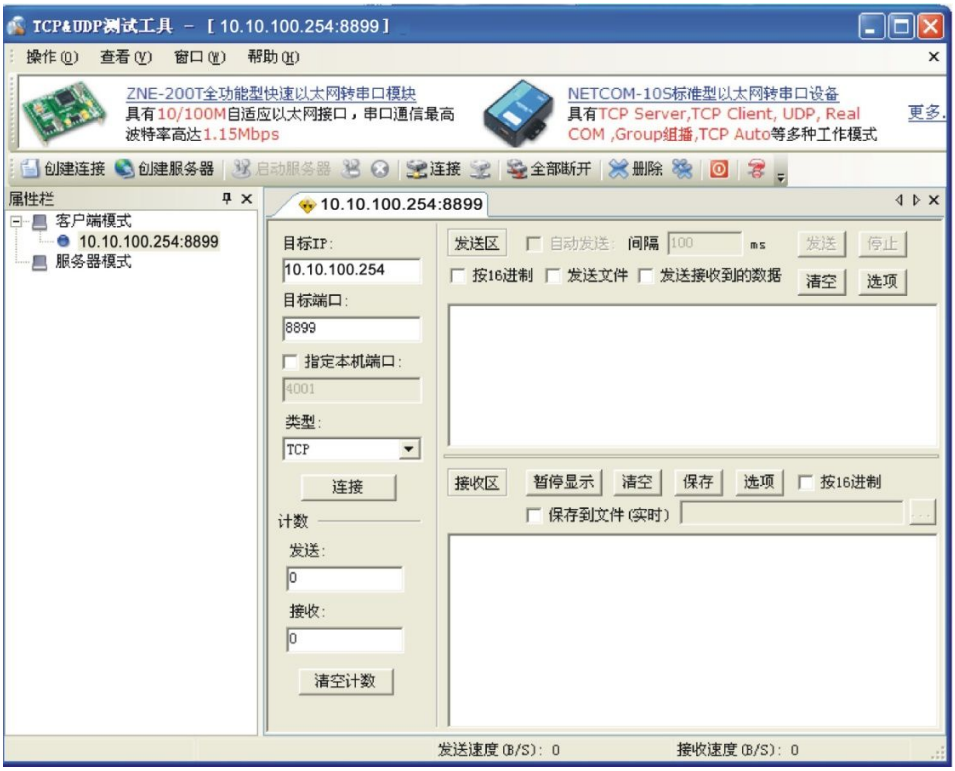


Figure -3 TCPUDPDbg debugger

Since UT-9061 module supports transparent transmission mode in default, it's allowable to send data to TCPUDPDbg tool via CommTools tool or to CommTools via TCPUDPDbg. All the data will be entirely transmitted to the other side and displayed.

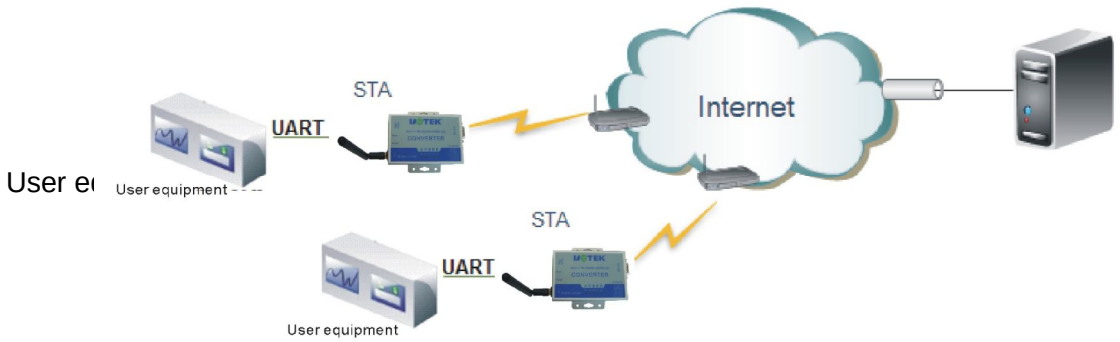
9.11 **Application examples**

9.11.1 Wireless remote control application

Wireless Remote Control Application Graph

As indicated above, the UT-9061 is used as AP and the serial port connects user equipment. The devices such as smart phone can support connection to UT-9061 module.

9.11.2 Remote connection application



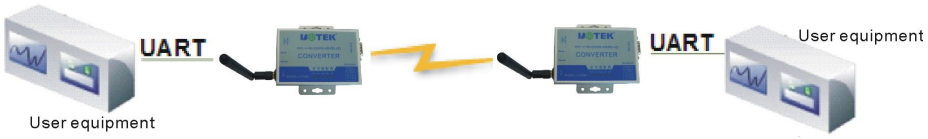
Remote Connection Application Graph

In the graph, the UT-9061 module is used as STA and is connected to Internet via gateway. The module is set to be TCP Client which is connected with the server of Internet.

Such networking application can send the data acquired by user equipment to the server for disposal and storage. The server can control the user equipment by commands.

9.11.3 Transparent serial port application

Two UT-9061 modules can form transparent serial port, as indicated below.



AP SSID：UT-9061
LAN IP：192.168.1.254

Net Prot：TCP Server
Protocol Port：8899

STA SSID：UT-9061
WAN IP：DHCP

Net Prot：TCP Client
Protocol Port：8899
LAN IPadd:10.10.100.254

Transparent Serial Port Application Graph

As shown in picture, set the left UT-9061 in AP mode, SSID and IP address are default. Set the network agreement in TCP/Server mode. The agreement port is 8899 in default; set the right UT-9061 in STA mode, set SSID to be the SSID of AP (UT-9061), with default of DHCP. Set the network agreement in TCP/Client mode and the agreement port is 8899. Set the opposite terminal IP address as the address of the left module, i.e. 10.10.100.254.

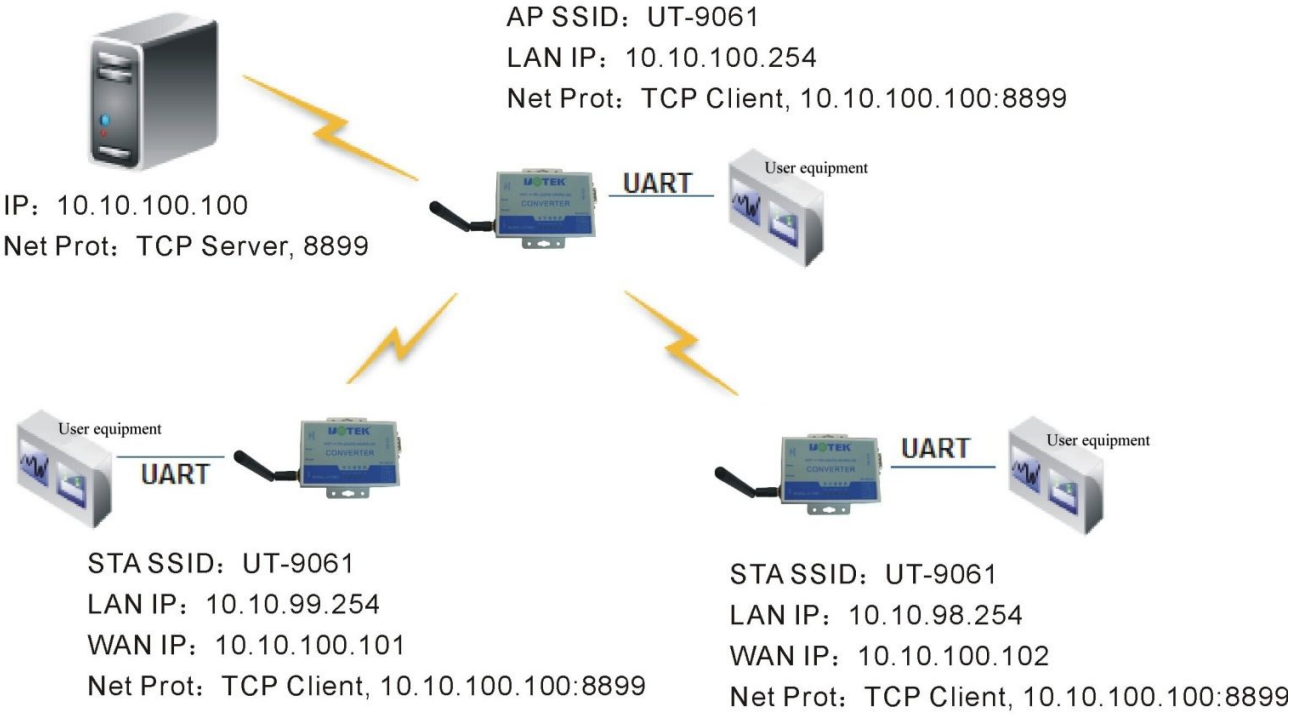
When the right module starts, it will find AP (SSID: UT-9061) and then automatically start TCP client side and connect the TCP Server of the left module. When all the connections are finished automatically, the UART at two sides can transmit data transparently.

Note: the IP address at the LAN port should be modified into one which is beyond the same network segment at WAN port, as shown below: 10.10.100.254.

The address obtained from the left module by DHCP at WAN port is 10.10.100.xxx.

9.11.4 Wireless DAQ card

Taking PC as data server, add UT-9061 module on each DAQ card to provide wireless function, as indicated below:



Wireless DAQ Card Graph

Each UT-9061 module connects user equipment via UART used as DAQ card, among which one is used as AP, others are used as STA and one PC is used as DAQ server. The UT-9061 module used as STA and PC connect with the UT-9061 module used as AP via wireless network to create wireless network.

Start TCP Server on PC, and all the TCP UT-9061 modules start TCP Client to connect with PC. As a result, the data acquired by each DAQ card can be transmitted to PC for uniform disposal and storage.

X. AT Order Instructions

10.1 Module operating mode

UT-9061 module has 2 kinds of working modes. In default case (i.e. in starting), it will actively enter transparent transmission mode, in which the user can switch the module into command line mode by serial port commands.

The parameters configuration at default UART port in the mode is as follows: (relevant settings shall be made to the hyperterminal of PC)

Serial port settings	
Baud rate	57600
Data bit	8
Check bit	None
Stop bit	1
CTSRTS	Disable

UT-9061 Default UART Parameters

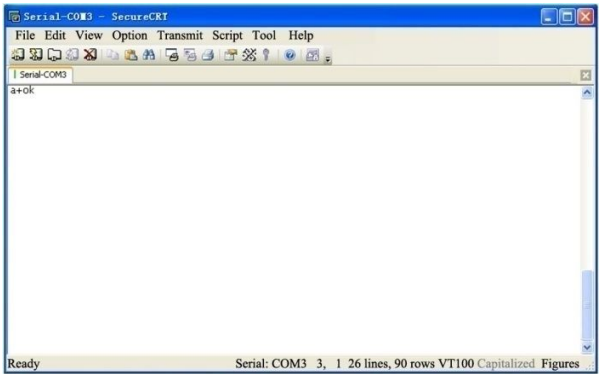
In command line mode, the user can set the module with AT+ command at UART port. The functions can completely cover the settings in web page.

10.2 Switch from transparent transmission mode to command mode

There are 2 steps for switching from transparent transmission mode to command mode:

Input “+++” at UART port; a confirmation code of “a” will be returned after the module receives “+++”;

Input “a” at UART port; return to “+ok” to confirm after the module receives the confirmation code so as to enter command mode;

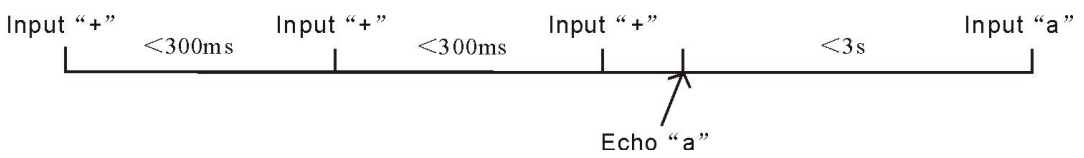


Switch From Transparent Transmission Mode to Command Mode

<Notes>:

When “+++” and confirmation code of “a” are input, there is no echo at serial port, as indicated above.

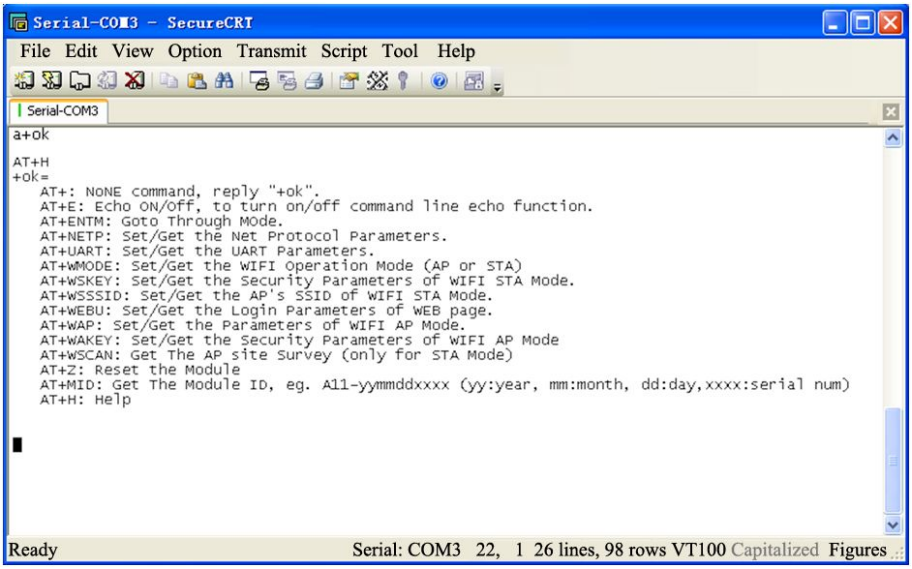
The inputting of “+++” and “a” shall be finished in a certain time to reduce the probability of entering command mode in normal work status.



In command mode, you may make AT+ command at UART port to set, inquire or restart the module and return to transparent transmission mode by AT+ command. Refer to next chapter for the details of AT+ command.

10.3 AT+ command overview

AT+ command can be input directly by the serial port debugger such as hyperterminal or input by programming. As indicated below, with SecureCRT tool, AT+H is a help command to list all the commands and instruction.



AT+ Command Schematic Diagram

10.3.1 Command format

AT+ command adopts the command lines based on ASCII code. The command format is as follows:

Format description

< >: representing the parts must be included

[ ]: representing the parts may be selected

Command message

AT+<CMD>[op][para-1,para-2,para-3,para-4…]<CR>

AT+: command information prefix

CMD: command character string

[op]: command operator, specified as parameters settings or inquiry

"=": representing parameter settings

"无": representing inquiry

[para-n]: input in parameter settings, no need for inquiry

<CR>: end mark, enter, ASCII code 0x0a or 0x0d

<Notes>:

During echoing, the end mark will automatically transfer into 0x0a0d. During inputting command, the character of "AT+<CMD>" will automatically echo into capital letters. The parameters will remain unchanged.

Response message

+<RSP>[op] [para-1,para-2,para-3,para-4…]<CR><LF><CR><LF>

+: response message prefix

RSP: response character string, including:

ok: representing success

ERR: representing failure

[op]: =
[para-n]: return to parameters during inquiry or error code during errors
<CR>: ASCII code 0x0d
<LF>: ASCII code 0x0a
error code

Error Code List	
Error code	Descriptions
-1	Invalid command format
-2	Invalid command
-3	Invalid operator
-4	Invalid parameter
-5	Not allowed operation

10.3.2 Command set

AT+ Command List	
Command	Descriptions
(Empty)	Empty command
E	Open/close echo function
ENTM	Enter transparent transmission mode
NETP	Set/inquire network agreement parameters
UART	Set/inquire serial port parameters
UARTF	Open/close automatic framing function
UARTFT	Set/inquire automatic framing triggering time
UARTFL	Set/inquire automatic framing triggering length
TMODE	Set/inquire data transmission mode (transparent transmission mode or agreement mode)
WMODE	Set/inquire WIFI operating mode (AP or STA)
WSKEY	Set/inquire encryption parameters in WIFI STA mode
WSSSID	Set/inquire AP SSID in WIFI STA mode
WSLK	Inquire link status in STA mode
WEBU	Set/inquire login parameters (user name, password) in WEB page
WAP	Set/inquire parameters in WIFI AP mode
WAKEY	Set/inquire encryption parameters in WIFI AP mode
HIDESSID	Set/inquire whether conceal modules or not
MSLP	Set module into low-power dissipation mode, close WIFI
WSCAN	Search AP in STA mode
TCPLK	Inquire whether the TCP link has created links
TCPDIS	Link/Disconnect TCP (only effective in TCP Client)
WANN	Set/inquire WAN settings, only effective in STA mode
LANN	Set/inquire LAN settings, only effective in AP mode
DHCPDEN	Enable/Disable DHCP Server at LAN port
DHCPGW	Set/inquire DHCP gateway address
TCPTO	Set/inquire TCP timeout
MAXSK	Set/inquire max. TCP connection number

TCPB	Enable/Disable TCPB functions
TCPPTB	Set/inquire port number of TCPB
TCPADDB	Set/inquire server address of TCPB
TCPTOB	Set/inquire TCPB timeout
TCPLKB	Inquire whether the TCPB link has created links
EPHY	Open/close ETH port
STTC	Enable/Disable STA port scan function
DOMAIN	Set/inquire domain name of login module page
FRLDEN	Enable/Disable functions of nReload pin
RELD	Recover ex-factory settings
Z	Restart module
MID	ID Inquiry module ID
VER	Inquiry software version
H	Help command

<Note>:
UT-9061 module can work in either AP or STA mode. Use different commands to set WIFI parameters.

1.1.1.1 AT+E

Function: open/close echo function
Format:

AT+E<CR>
+ok<CR>< LF ><CR>< LF >

When the module switches from transparent transmission mode to command mode, the default echo function is open. Close echo function after inputting AT+E for the first time and then open echo function after inputting again.

1.1.1.2 AT+ENTM

Function: enter transparent transmission mode
Format:

AT+ENTM<CR>
+ok<CR>< LF ><CR>< LF >

When this command is executed correctly, the module switches from command mode to transparent transmission mode. If it needs to enter command mode again, you may input "+++" and confirmation code to return to command mode.

1.1.1.3 AT+NETP

Function: set/inquire network agreement parameters
Format:

Inquire: AT+NETP<CR>
+ok=<protocol, CS, port, IP><CR>< LF ><CR>< LF >
Set: AT+NETP=<protocol, CS, port, IP><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:
Protocol: agreement type, including
TCP
UDP

CS: server side or client side, including
SERVER: server side
CLIENT: client side
Port: agreement commodity, decimal number, less than 65535
IP: when the module is TCP client or UDP, server address (you may input the IP address or domain name of the server).
The set parameters will be effective after the module is restarted.

1.1.1.4 AT+UART

Function: set/inquire serial port parameters
Format:
Inquire: AT+UART<CR>
+ok=<baudrate, data_bits, stop_bit, parity, flowctrl><CR>< LF ><CR>< LF >
Set: AT+UART=<baudrate, data_bits, stop_bit, parity><CR>
+ok<CR>< LF ><CR>< LF >
Parameter:
baudrate: baud rate, allowable
1200, 1800, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 345600, 460800
data_bits: data bit, allowable
5, 6, 7, 8
stop_bits: stop bit, allowable
1, 2
parity: check bit, allowable
NONE: without check bit
EVEN: even check
ODD: odd check
MARK: positive check
SPACE: negative check
flowctrl: hardware flow control (CTSRTS)
NFC: without hardware flow control
FC: with hardware flow control
The set parameters will be effective after the module is restarted.

1.1.1.5 AT+UARTF

Function: open/close automatic framing function
Format:
Inquire: AT+ UARTF<CR>
+ok=<para><CR>< LF ><CR>< LF >
Set: AT+ UARTF=<para ><CR>
+ok<CR>< LF ><CR>< LF >
Parameter:
para: both disable or enable may be valued, representing close or open automatic framing function

1.1.1.6 AT+UARTFT

Function: set/inquire automatic framing triggering time

Format:

Inquire: AT+ UARTFT<CR>

+ok=<time><CR>< LF ><CR>< LF >

Set: AT+ UARTFT=<time><CR>

+ok<CR>< LF ><CR>< LF >

Parameter:

time: automatic framing triggering time, the unit is ms. Value range:100~10000.

1.1.1.7 AT+UARTFL

Function: set/inquire automatic framing triggering length

Format:

Inquire: AT+ UARTFL<CR>

+ok=<len><CR>< LF ><CR>< LF >

Set: AT+ UARTFL=<len><CR>

+ok<CR>< LF ><CR>< LF >

Parameter:

len: automatic framing triggering length, the unit is byte. Value range: 16~4096.

1.1.1.8 AT+TMODE

Function: set/inquire data transmission mode (transparent transmission modeor agreement mode)

Format:

Inquire: AT+TMODE<CR>

+ok=<tmode><CR>< LF ><CR>< LF >

Set: AT+ TMODE=<tmode><CR>

+ok<CR>< LF ><CR>< LF >

Parameter:

tmode: data transmission mode, including

Through: transparent transmission mode

Agreement: agreement transmission mode

The set parameters will be effective after the module is restarted.

1.1.1.9 AT+WMODE

Function: set/inquire WIFI operating mode (AP or STA)

Format:

Inquire: AT+WMODE<CR>

+ok=<mode><CR>< LF ><CR>< LF >

Set: AT+ WMODE=<mode><CR>

+ok<CR>< LF ><CR>< LF >

Parameter:

mode: WIFI operating mode, including

AP: wireless access point mode

STA: wireless terminal mode

The set parameters will be effective after the module is restarted.

1.1.1.10 AT+WSKEY

Function: set/inquire encryption parameters in WIFI STA mode.

Format:

Inquire: AT+WSKEY<CR>

+ok=<auth,encry,key><CR>< LF ><CR>< LF >

Set: AT+ WSKEY=< auth,encry,key><CR>

+ok<CR>< LF ><CR>< LF >

Parameter:

auth: authentication mode, including

OPEN

SHARED

WPAPSK

encry: encryption algorithm, including

NONE: effective when auth=OPEN

WEP-H: effective when auth=OPEN or SHARED (WEP, HEX)

WEP-A: effective when auth=OPEN or SHARED (WEP, ASCII)

TKIP: effective when auth= WPAPSK

AES: effective when auth= WPAPSK

key: password, when encry=WEP-H, the password is hexadecimal number, 10 or 26 bits; when encry=WEP-A, the password is ASCII code, 5 or 13 bits; otherwise the password is ASCII code, less than 64 bits and more than 8 bits.

This parameter is only effective in STA mode. The set parameters will be effective after the module is restarted. But such parameters can be set as well in AP mode.

1.1.1.11 AT+WSSSID

Function: set/inquire AP SSID in WIFI STA mode

Format:

Inquire: AT+WSSSID<CR>

+ok=<ap's ssid><CR>< LF ><CR>< LF >

Set: AT+ WSSSID=<ap's ssid ><CR>

+ok<CR>< LF ><CR>< LF >

Parameter:

ap's ssid: SSID of AP

This parameter is only effective in STA mode. The set parameters will be effective after the module is restarted. But such parameters can be set as well in AP mode.

1.1.1.12 AT+WSLK

Function: Inquire link status in wireless STA mode (can only be used in STA mode)

Format:

Inquire: AT+ WSLK<CR>

+ok=<ret><CR>< LF ><CR>< LF >

Parameter:

ret:

If there is no connection: return "Disconnected"

If there is connection: return "SSID of AP (MAC of AP)"

If WIFI is not open: return "RF Off"

This parameter is only effective in STA mode.

1.1.1.13 AT+WEBU

Function: set/inquire login parameters of WEB page (user name, password)

Format:

Inquire: AT+WEBU<CR>
+ok=<usr,password><CR>< LF ><CR>< LF >

Set: AT+ WEBU=< usr,password ><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:

usr: user name for WEB page visiting

password: password for WEB page visiting

1.1.1.14 AT+WAP

Function: set/inquire parameters in WIFI AP mode

Format:

Inquire: AT+WAP<CR>
+ok=<wifi_mode,ssid,channel><CR>< LF ><CR>< LF >

Set: AT+ WAP=<wifi_mode,ssid,channel><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:

wifi_mode: WIFI mode, including

11BG

11B

11G

11BGN

11N

ssid: SSID of AP mode

channel: WIFI channel selection, AUTO or CH1~CH11

This parameter is only effective in AP mode. The set parameters will be effective after the module is restarted. But such parameters can be set as well in STA mode.

1.1.1.15 AT+WAKEY

Function: set/inquire encryption parameters in WIFI AP mode

Format:

Inquire: AT+WAKEY<CR>
+ok=<auth,encry,key><CR>< LF ><CR>< LF >

Set: AT+ WAKEY=< auth,encry,key><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:

auth: authentication mode, including

OPEN

SHARED

WPAPSK

encry: encryption algorithm, including

NONE: effective when auth=OPEN

WEP-H: effective when auth=OPEN or SHARED (WEP, HEX)

WEP-A: effective when auth=OPEN or SHARED (WEP, ASCII)
TKIP: effective when auth= WPAPSK
AES: effective when auth= WPAPSK
TKIPAES: effective when auth= WPAPSK
key: password, when encry=WEP-H, the password is hexadecimal number, 10 or 26 bits; when encry=WEP-A, the password is ASCII code, 5 or 13 bits; otherwise the password is ASCII code, less than 64 bits and more than 8 bits.
This parameter is only effective in AP mode. The set parameters will be effective after the module is restarted. But such parameters can be set as well in STA mode.

1.1.1.16 AT+ HIDESSID

Function: set/inquire whether conceal SSID of module AP
Format:
Inquire: AT+HIDESSID<CR>
+ok=<sta.><CR>< LF ><CR>< LF >
Set: AT+ HIDESSID =< sta.><CR>
+ok<CR>< LF ><CR>< LF >
Parameter:
During inquiry, sta.: whether the SSID returning to module AP is concealed, e.g.
on, representing no concealed SSID
off, representing no concealed SSID
During settings, no concealed SSID is set for off and concealed SSID is set for on.

1.1.1.17 AT+MSLP

Function: module enters into sleep mode (WIFI is not available)
Format:
Inquire: AT+ MSLP <CR>
+ok=<sta.><CR>< LF ><CR>< LF >
Set: AT+ MSLP=<on/off><CR>
+ok<CR>< LF ><CR>< LF >
Parameter:
During inquiry, sta.: whether the return module is sleeping, e.g.
on, representing no sleeping
off, representing sleeping
During settings, off means that the module enters into sleep mode, on means that the module exits sleep mode
When the module enters into sleep mode, input AT+MSLP=on again, the module will exit sleep mode. The module is still in command mode.

1.1.1.18 AT+WSCAN

Function: search AP in STA mode
Format:
AT+ WSCAN<CR>
+ok=<ap_site><CR>< LF ><CR>< LF >
Parameter:
ap_site: searched AP station points

1.1.1.19 AT+TCPLK

Function: Inquire whether the TCP link is created
Format:
AT+ TCPLK<CR>
+ok=<sta><CR>< LF ><CR>< LF >
Parameter:
sta.: return whether the TCP has created links, e.g.
on, representing the link has been created
off, representing the link has not been created

1.1.1.20 AT+TCPDIS

Function: link/disconnect TCP (only effective in TCP Client)
Format:
Inquire: AT+ TCPDIS <CR>
+ok=<sta.><CR>< LF ><CR>< LF >
Set: AT+ TCPDIS=<on/off><CR>
+ok<CR>< LF ><CR>< LF >
Parameter:
During inquiry, sta.: return whether TCP Client is in linkable status, e.g.
on, representing linkable status
off, representing not linkable status
During settings, the module is set to be not linkable status for off, i.e. when the command is sent, the module will disconnect link immediately and never connect again; the module is set to be linkable status for on, i.e. when the command is sent, the module will connect again immediately.

1.1.1.21 AT+WANN

Function: set/inquire WAN settings, only effective in STA mode
Format:
Inquire: AT+WANN<CR>
+ok=<mode,address,mask,gateway><CR>< LF ><CR>< LF >
Set: AT+ WANN=< mode,address,mask,gateway ><CR>
+ok<CR>< LF ><CR>< LF >
Parameter:
mode: IP mode of WAN port, e.g.
static, static IP
DHCP, dynamic IP
address.: IP address of WAN port
mask: subnet mask of WAN port
gateway: gateway address of WAN port

1.1.1.22 AT+LANN

Function: set/inquire LAN settings, only effective in AP mode
Format:
Inquire: AT+LANN<CR>
+ok=<address,mask ><CR>< LF ><CR>< LF >
Set: AT+ LANN=<address,mask ><CR>
+ok<CR>< LF ><CR>< LF >
Parameter:
address.: IP address of LAN port

mask: subnet mask of LAN port

1.1.1.23 AT+ DHCPDEN

Function: enable/disable DHCP server function of LAN port

Format:

Inquire: AT+DHCPDEN<CR>
+ok=<sta.><CR>< LF ><CR>< LF >

Set: AT+ DHCPDEN=<sta.><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:

During inquiry, sta.: whether the returned DHCP server function of LAN port is enabled, e.g.
on, representing enabled DHCP server function
off, representing disabled DHCP server function
During settings, the disabled DHCP server function is set for off and enabled DHCP server function is set for on.

1.1.1.24 AT+DHCPGW

Function: set/inquire DHCP gateway address

Format:

Inquire: AT+ DHCPGW<CR>
+ok=<address><CR>< LF ><CR>< LF >

Set: AT+ DHCPGW=<address ><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:

address.: DHCP gateway address

1.1.1.25 AT+TCPTO

Function: set/inquire TCP timeout

Format:

Inquire: AT+ TCPTO<CR>
+ok=<time><CR>< LF ><CR>< LF >

Set: AT+ TCPTO=<time ><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:

time.:TCP timeout, <= 600 (600 sec), >=0 (0 represents no timeout), the default is 300

1.1.1.26 AT+MAXSK

Function: set/inquire max. TCP connection number

Format:

Inquire: AT+ MAXSK<CR>
+ok=<num><CR>< LF ><CR>< LF >

Set: AT+ MAXSK =<num ><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:

num: max. TCP connection number, may support 1～32, the default is 32.
When it's set as TCP Server, the module can support max. 32 TCP connections. Since the user needn't so many connection numbers, you may properly reduce the settings of such parameter.

1.1.1.27 AT+TCPB

Function: enable/disable TCPB function

Format:

Inquire: AT+TCPB <CR>
+ok=<sta.><CR>< LF ><CR>< LF >

Set: AT+ TCPB=<on/off><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:

During inquiry, sta.: whether the returned TCPB function is enabled, e.g.
on, representing enabled TCPB
off, representing disabled TCPB
The set parameters will be effective after the module is restarted.

1.1.1.28 AT+TCPPTB

Function: set/inquire port number of TCPB

Format:

Inquire: AT+TCPPTB <CR>
+ok=<port><CR>< LF ><CR>< LF >

Set: AT+ TCPPTB=<port><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:

port: agreement commodity, decimal number, less than 65535
The set parameters will be effective after the module is restarted.

1.1.1.29 AT+TCPADDB

Function: set/inquire server of TCPB

Format:

Inquire: AT+TCPADDB <CR>
+ok=<add><CR>< LF ><CR>< LF >

Set: AT+ TCPADDB=<add><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:

add: server address of TCPB (both the IP address or domain name of server can be input).
The set parameters will be effective after the module is restarted.

1.1.1.30 AT+TCPTOB

Function: set/inquire TCPB timeout

Format:

Inquire: AT+ TCPTOB<CR>
+ok=<time><CR>< LF ><CR>< LF >

Set: AT+ TCPTOB=<time ><CR>
+ok<CR>< LF ><CR>< LF >

Parameter:

time.: TCPB timeout, <= 600 (600 sec), >=0 (0 represents no timeout), the default is 300

1.1.1.31 AT+TCPLKB

Function: inquire whether the TCPB link has been created

Format:

AT+ TCPLKB<CR>

+ok=<sta><CR>< LF ><CR>< LF >

Parameter:

sta.: return whether the TCPB link has been created, e.g.

on, representing the link has been created

off, representing the link has not been created

1.1.1.32 AT+EPHY

Function: open/close 以太网接口

Format:

Set: AT+ EPHY<CR>

+ok<CR>< LF ><CR>< LF >

Parameter:

In order to reduce power dissipation, the Ethernet is disabled when the module is in default. After inputting such command, the Ethernet port is enabled. This command is not saved, i.e. the Ethernet will still be disabled after restarting. If the settings of enabled Ethernet need to be saved, the ex-factory settings command needs to be used.

Module power dissipation can be reduced when the Ethernet port is closed; so it's recommended that set to be closed when the Ethernet port is not used. The Ethernet port is closed in default settings.

1.1.1.33 AT+STTC

Function: enable/disable STA port scan function

Format:

Inquire: AT+STTC <CR>

+ok=<sta.><CR>< LF ><CR>< LF >

Set: AT+STTC=<on/off><CR>

+ok<CR>< LF ><CR>< LF >

Parameter:

During inquiry, sta.: return whether the STA port scan function is enabled, e.g.

on, enabled STA port scan function

off, Function disabled STA port scan function

1.1.1.34 AT+ DOMAIN

Function: set/inquire domain name of login module page

Format:

Inquire: AT+DOMAIN <CR>

+ok=<Domain><CR>< LF ><CR>< LF >

Set: AT+DOMAIN=< Domain><CR>

+ok<CR>< LF ><CR>< LF >

Parameter:

Domain: domain name of login module page

1.1.1.35 AT+ FRLDEN

Function: enable/disable nReload pin function

Format:

Inquire: AT+FRLDEN <CR>

+ok=< on/off.><CR>< LF ><CR>< LF >

Set: AT+FRLDEN=<on/off><CR>
+ok<CR>< LF ><CR>< LF >
Parameter:
on/off.: return whether enabled nReload pin function, e.g.
on, enabled nReload pin function
off, disabled nReload pin function
Note: AT+FRLDEN is F- settings, i.e. the recover ex-factory settings is invalid to this setting.

1.1.1.36 AT+RELD

Function: recover ex-factory settings
Format:
AT+ RELD<CR>
+ok=rebooting…<CR>< LF ><CR>< LF >
This command can recover the ex-factory settings of the module which will automatically restart later on.

1.1.1.37 AT+Z

Function: restart module
Format:
AT+ Z<CR>
restart module

1.1.1.38 AT+MID

Function: inquire module ID
Format:
Inquire: AT+MID<CR>
+ok=<module_id><CR>< LF ><CR>< LF >
Parameter:
module_id: module ID, Format
A11-yymmddnnnn
yymmdd: representing production date, year, month and date respectively
nnnn: representing production series number

1.1.1.39 AT+VER

Function: inquire software version
Format:
Inquire: AT+VER<CR>
+ok=<ver><CR>< LF ><CR>< LF >
Parameter:
ver: return the software version of module

1.1.1.40 AT+H

Function: help command
Format:
Inquire: AT+H<CR>
+ok=<commod help><CR>< LF ><CR>< LF >
Parameter:
commod help: command line description

XI. FAQ

11.1 Two UT-9061 modules are interconnected, how to set if use UDP agreement as transparent serial port?

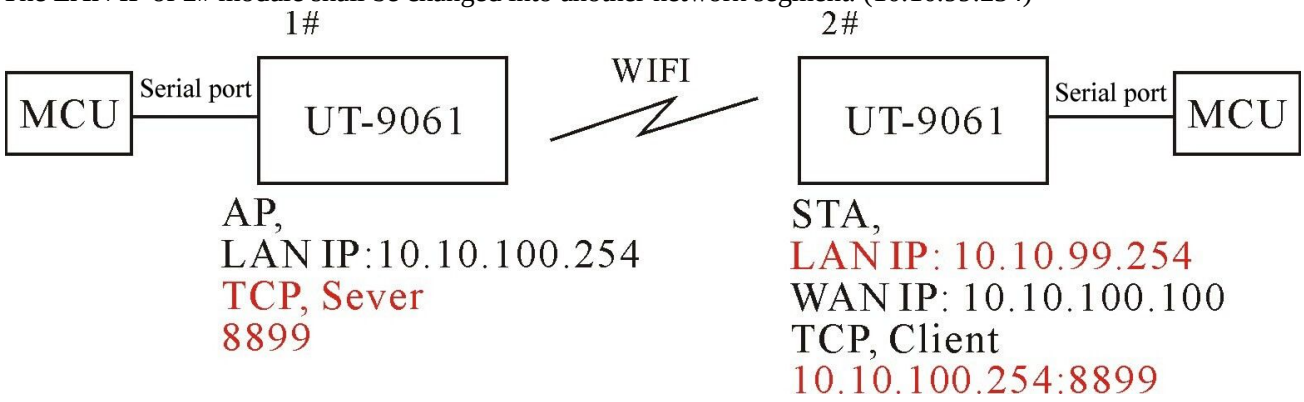
As shown in picture

Use 1# as AP and change the agreement into UDP, IP address is 10.10.100.100

2# module WAN IP: 10.10.100.100. Use 2# as STA, WAN port address or dynamic acquisition or static settings (suggest using static address), e.g. set as 10.10.100.100.

The settings for TCP agreement of 2# module is as follows: UDP, port 8899 unchanged, IP address is LAN IP address of 10.10.100.254 of 1# module (namely AP).

The LAN IP of 2# module shall be changed into another network segment. (10.10.99.254)



11.2 Two UT-9061 modules set as STA and are interconnected by AP, how to set if use as transparent serial port?

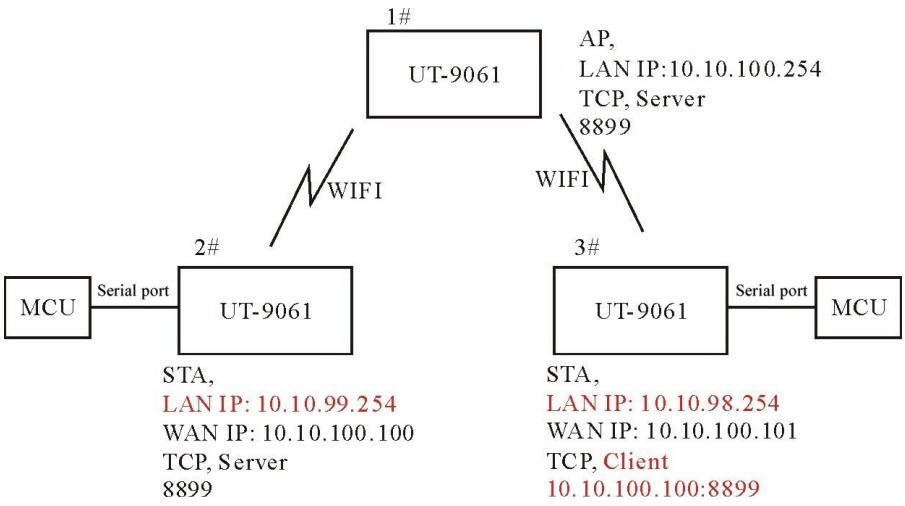
As shown in picture, since the UT-9061 can also be used as AP. Here take the AP of UT-9061 module as an example:

1# module is AP, it will be all right for default settings.

2# module is STA, WAN IP is 10.10.100.100, TCP Server

3# module is STA, WAN IP is 10.10.100.101, TCP Client, and the agreement address is the WAN IP of 10.10.100.100 of 2# module. The port of both 2# and 3# module is the same, i.e. 8899.

Change the LAN IP of 2# module into 10.10.99..254 and the LAN IP of 3# module into 10.10.98.254 to prevent conflict.



11.3 How to avoid IP address conflict when using UT-9061 module?

The IP address range dynamically allocated in UT-9061 module can be defined from 100 to 200.

If the default address is 10.10.100.254. When the module used as AP, the allocated address for STA starts from 10.10.100.100 to the max. 10.10.100.200.

If the static allocation address is needed for network, the available address is from 10.10.100.1 to 10.10.100.99 to avoid conflict between dynamic allocated addresses and static allocated addresses.

11.4 The UT-9061 module is connected with PC (server) respectively, how to set it?

As shown in picture, the 3 modules connect with 3 TCP created by PC:

3 modules are used as DAQ cards. 1# is used as AP. PC and other 2 modules connect with WIFI of 1# module.

The IP address of PC is 10.10.100.100, used as TCP server. The port is 8899.

1# module agreement settings: TCP client, 10.10.100.100:8899

2# module WAN IP is 10.10.100.101, agreement settings: TCP client, 10.10.100:8899

3# module WAN IP is 10.10.100.102, agreement settings: TCP client, 10.10.100.100:8899

Change the LAN IP of 2# module into 10.10.99.254 and the LAN IP of 3# module into 10.10.98.254 to prevent conflict.