Setting Agreement

This manual shows the network setting protocol of USR-TCP232-410s, USR-N510, USR-N520, USR-N540, USR-USRIOT converter or module, USR-TCP232-E2. Using this setting protocol, user can develop a matching setting software, or can use the setting software provided by USR IOT.

1. Process of setting parameters

1.1 Create a SOCKET:

Create a UDP SOCKET with a destination IP of 255.255.255.255 and a destination port of 1901.

1.2 The flow of setting instructions is:

① The network sends a search command

② USRIOT converter or module returns IP address and MAC

③ The network reads the USRIOT converter or module parameters.

④ Composition setting instruction according to the MAC address, the known user name & password and the parameters to be set (Parameters that do not need to be modified remain intact)

⑤ Send setting instructions

⑥ USRIOT converter or module return settings are correct

⑦ host computer sends a storage configuration command

⑧ USRIOT converter or module return settings are correct

⑨ Send Restart command

⑩ USRIOT converter or module return settings are correct

2. Setting instruction content

2.1 Command Query table

Command Query Table

Function	Head of data package	Length (command~ parameters)	Command	MAC add(6 bytes)	User name & password(12 bytes)	Parameter	Check bit (sum)
search	FF	01	01	-	-	-	02
Reset	FF	xx	02	[MAC]	[usrname] [password]	-	xx
Read configuration	FF	xx	03	[MAC]	[usrname] [password]	-	xx
Storage settings	FF	xx	04	[MAC]	[usrname] [password]	-	xx
Basic Settings	FF	xx	05	[MAC]	[usrname] [password]	Basic parameter	xx
Serial port 0 setting	FF	xx	06	[MAC]	[usrname] [password]	Port parameter	xx
Serial port 1 setting	FF	xx	07	[MAC]	[usrname] [password]	Port parameter	xx
Serial port 2 settings	FF	xx	08	[MAC]	[usrname] [password]	Port parameter	xx
USR Cloud			0x10	[MAC]	[usrname]		

settings					[password]		

Note: The check digit is the sum check. It starts from the length byte (including the length) and is added before the check (excluding the check). The result is the check value, leaving only the low byte.

2.2 Examples of some instructions

① search instruction example

The search command is fixed to:

FF 01 01 02

sum check 02 = 01 + 01

② reset instruction example

FF 13 02 D8 B0 4C C0 0D 65 61 64 6D 69 6E 00 61 64 6D 69 6E 00 2D

sum check example

2D = 13 + 02 + … + 6E + 00

Among them, the user name and password are both 5 bytes + 00 bits, Insufficient, use 0 to make up.

③ read configuration instructions example

Send (16 bytes): FF 13 03 D8 B0 4C C0 0D 65 61 64 6D 69 6E 00 61 64 6D 69 6E 00 2E

④ Example of storing read configuration instructions

Send (16 bytes)：FF 13 04 D8 B0 4C C0 0D 65 61 64 6D 69 6E 00 61 64 6D 69 6E 00 2F

2.3 Some instructions are explained in detail

① Basic configuration parameter instructions

Table 1 Basic parameters

name	byte	example	Description
ucSequenceNum	1	xx	Please write the read back value as it is.

ucCRC	1	xx	Please write the read back value as it is.
ucVersion	1	xx	Please write the read back value as it is.
ucFlags	1	80	IP address type: The 8th bit is 0: DHCP; 1: Static IP
usLocationURLPort	2	20 19	Please write the read back value as it is.
usHTTPServerPort	2	50 00	HTTP service port
ucUserFlag	1		Please write the read back value as it is.
ulStaticIP	4	38 00 A8 C0	Static IP address
ulGatewayIP	4	01 00 A8 C0	Gateway
ulSubnetMask	4	00 FF FF FF	Subnet mask
ucModName	16	55 53 52 2D 54 43 50 32 33 32 2D 45 00 00 00 00	USRIOT converter or module name
username	6	61 64 6D 69 6E 00	username
password	6	61 64 6D 69 6E 00	password
ucNetSendTime	1		Please write the read back value as it is.
uiId	2	01 00	Device ID
ucIdType	1	0	Device ID type (0~3) 0:no use 1:send id when connect 2:send id when send data 3:both
ucUserMAC	6	FF FF FF FF FF FF	MAC address
ucReserved	8		Unused

Example:

FF 56 05 D8 B0 4C C0 0D 65 61 64 6D 69 6E 00 61 64 6D 69 6E 00 04 78 03 00 20 19 50 00 02 07 00 A8 C0 01 00 A8 C0 00 FF FF FF 55 53 52 2D 4B 33 00 00 00 00 00 00 00 00 00 00 61 64 6D 69 6E 00 61 64 6D 69 6E 00 02 01 00 00 D8 B0 4C C0 0D 65 10 0E 00 00 01 00 00 00 31

② port configuration parameter instructions

Name	Byte	Example	Description
ulBaudRate	4	00 C2 01 00	Serial port baud rate
ucDataSize	1	08	Serial data bit (0X05/0x06/0x07/0x08)
ucParity	1	01	Serial parity bit 1：no，2：odd，3：even，4：mark，5：space
ucStopBits	1	01	Serial port stop (0x01/0x02)
ucFlowControl	1	01	Serial flow control (0x01：no，0x03：HW)
ulTelnetTimeout	4	00 00 00 00	Network reconnection time
usTelnetLocalPort	2	17 00	Local port
usTelnetRemotePort	2	17 00	Remote port
uiTelnetURL	30	31 39 32 2E 31 36 38 2E 30 2E 31 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	IP address or domain name is sent in ASCII code An example is: 192.168.0.1
ulTelnetIPAddr	4	00 00 00 00	Not used
ucFlags	1	02	Special option Enable MODBUSTCP function：0x010(bit2) Enable 2217 function：0x08(bit3) Enable transparent cloud function：0x010(bit4)

ucWorkMode	1	03	Operating mode 0：UDP, 1：TCP Client, 2：UDP Server, 3：TCP Server, 4：Httpd Client
uiPackLen	4	C8 00 00 00	Serial port packing length
ucPackTime	1	0A	Serial port packing time
ucTimeCount	1	91	Please write the read back value as it is.
TCP server type	1	1	Please write the read back value as it is.
ucReserved	4	Arbitrary value	Keep the extension.

Example:

FF 52 06 D8 B0 4C C0 0D 65 61 64 6D 69 6E 00 61 64 6D 69 6E 00 00 C2 01 00 08 01 01 01 00 00 00 00 17 00 17 00 31 39 32 2E 31 36 38 2E 30 2E 32 30 31 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 09 03 00 00 00 00 00 00 81 01 01 01 01 85

3. Return instruction content

command returns results

Byte	Name	Example	Description
0	TAG_STATUS	FF	
1	Packet_length	24	
2	CMD_DISCOVER_TARGET	01	
3	Board_type	00	
4	Board_ID	00	
5~8	Client_IP_address	C0 A8 00 07	Device IP (high position first)
9~14	MAC_address	AC CF 23 20 FE 3D	Device MAC (high position first)
15~18	Firemware_version	D0 07 12 34	D0 07: device version number (lower first)

			12 34: For the encrypted version, others are the non-encrypted version; the encrypted version directly upgrades the encryption program, and the non-encrypted version must first decrypt the encrypted program and then send it.
19~34	Application_title	55 53 52 2D 54 43 50 32 33 32 2D 35 30 30 00 00	Device name
35	checksum	F0	(This check value users can ignore it) The initial value of Checksum is 0x00, and the TAG_STATUS byte is subtracted in turn, until the last byte of the data part, and the final result is checksum.

Example:

The result of the search instruction (36 bytes):

FF 24 01 00 00 C0 A8 01 6B D8 B0 4C C0 0D 65 C3 0B 01 00 55 53 52 2D 4B 33 00 00 00 00 00 00 00 00 00 00 8E

The check byte is the subtraction check. The initial value is 0x00, and each byte is subtracted in turn. The algorithm is as follows:

0x8E = 00 - FF - 24 - 01 - 00 - 4B - ... - 31 - 00 - 00

1. Reset instruction returns result

Response (4 bytes): FF 01 02 4B If the user password is correct 4B = 'K'

FF 01 02 45 Username password error 45 = 'E'

2. Read the instruction to return the result

description:

Returned all the parameters of the network USRIOT converter or module, a total of 180 bytes, without verification

No protocol, return parameters directly

Return content: 180 bytes (basic parameter + serial port parameter + transparent cloud parameter) (refer to the basic parameters and serial port parameters)

3. Store the return result of the configuration command

Set the correct return:

FF 01 04 4B

4. Store the return result of the configuration command

FF 01 05 4B

5. Other return results

Checksum error: return 'E' + correct check value

Correct execution: FF 01 CMD 'K'

Username password error returned: FF 01 CMD 'P'

Other errors returned: FF 01 CMD 'E'