

Industrial 5G Router

USR-G816

User Manual



V2.0

Be Honest & Do Best

Your Trustworthy Smart Industrial IoT Partner

Content

1. Introduction	5 -
1.1. Features	5 -
1.2. Parameters table	6 -
1.3. Indicator introduction	7 -
1.4. Dimension	8 -
2. Get Started	8 -
2.1. Login router	8 -
2.2. Brief introduction of the webpage	9 -
3. Status & System	10 -
3.1. Status	10 -
3.2. System (Hostname)	10 -
3.3. Administration password	11 -
3.4. Reboot timer (Timed restart function)	12 -
3.5. NTP service	12 -
3.6. HTTP port	13 -
3.7. System log	14 -
3.8. Backup/Upgrade	15 -
3.9. Reboot	16 -
4. Network introduction	17 -
4.1. WAN interface	17 -
4.1.1. WAN_5G interface	17 -
4.1.2. WAN_WIRED interface	17 -
4.2. LAN interface	20 -
4.3. Cellular network	21 -
4.3.1. Configuration	21 -
4.3.2. SIM1/SIM2 configuration	22 -
4.3.3. Module information	24 -
4.4. Network switch	24 -
4.5. Wireless (Wi-Fi)	25 -
4.5.1. Wi-Fi settings of 2.4 & 5.8G	25 -
4.5.2. Client information	26 -



	4.6. WWAN(STA)	- 27 -
	4.6.1. Basic settings	- 27 -
	4.6.2. 2.4G / 5.8G settings	- 27 -
	4.6.3. AP information	- 29 -
	4.7. DHCP introduction	- 30 -
	4.8. Static routes	- 30 -
	4.8.1. Static routing adding	- 30 -
	4.8.2. Router table	- 31 -
	4.9. WAN/LAN port switching	- 32 -
	4.10. Network diagnostics	- 33 -
5.	VPN	- 33 -
	5.1. PPTP Client	- 33 -
	5.2. L2TP Client	- 35 -
	5.3. OpenVPN	- 36 -
	5.3.1. OpenVPN client	- 37 -
	5.3.2. OpenVPN server	- 39 -
6.	Firewall	- 39 -
	6.1. General Settings	- 39 -
	6.2. Port forward	- 40 -
	6.2.1. Port forward	- 40 -
	6.2.2. DMZ function	- 41 -
	6.3. Traffic rules	- 42 -
	6.3.1. Open ports on router	- 43 -
	6.3.2. Add new forward rule	- 44 -
	6.3.3. Source NAT	- 45 -
	6.4. Access restrictions	- 47 -
7.	DTU Function	- 50 -
	7.1. General settings	- 51 -
	7.1.1. Protocol selection	- 51 -
	7.1.2. Heartbeat packet	- 52 -
	7.1.3. Registration packet	- 52 -
	7.1.4. Advanced settings(AT command password)	- 54 -
	7.2. Serial port settings	- 54 -



7.2.1. Parameter description 54 -
7.2.2. Packeting mechanism 55 -
7.3. SOCKET 56 -
7.4. HTTP Client 58 -
7.5. Modbus gateway setting and test 59 -
7.6. Transparent data communication 61 -
8. Additional services 63 -
8.1. PUSR Cloud 63 -
8.1.1. Add USR-G816 on PUSR Cloud 63 -
8.1.2. Gateway Information 65 -
8.1.3. Remote access 66 -
8.1.4. Firmware upgrade 67 -
8.1.5. Alarm settings 68 -
8.2. DDNS 70 -
9. Contact Us 73 -
10. Disclaimer 73 -



1. Introduction

1.1. Features

Stable and reliable

- Industrial grade design for harsh environments, IP30 mental housing.
- Support DIN rail mounting, wall mounting and flat surface placement.
- Wide input voltage range 9~36VDC, reverse polarity protection.
- Multiple EMC protection: Surge, EFT and ESD protection
- Built-in hardware watchdog, fault self-detection and self-repair, to ensure system stability.

Flexible networking

- Dual sim cards, single standby.
- Supports 5G SA/NSA network, compatible with 4G/3G network.
- Equipped with gigabit Ethernet ports: 1*WAN/LAN (Switchable), 3*LAN.
- Equipped with 1*RS232/RS485 serial port which can be directly connected to sensors and other serial acquisition devices for data transmission.
- Optional GNSS function, realize precise positioning of assets.
- Supports dual band Wi-Fi, adopting Qualcomm chip.

Powerful function

- Supports 5G APN/VPDN sim cards.
- Supports worldwide main frequency band with 4G network backup.
- Support Modbus TCP/RTU protocol conversion, transparent TCP/UDP/HTTP data communication.
- Built-in ICMP keep-alive detection, heartbeat packet detection and other functions to ensure the stable operation of the device.
- Supports firewall, NAT, DMZ, port forwarding, access restriction, etc. to ensure data security.
- Cooperating with PUSR service, it can realize centralized management of remote equipment and improve operation and maintenance efficiency.
- Supports mainstream VPN: PPTP, L2TP and enhanced OpenVPN.



1.2. Parameters table

Table 1. Parameters of USR-G816

		USR-G816 specifications
Cellular Interface	Frequency	5G NR sub-6 GHz (3GPP Rel-16) Band(NA/NSA): n1/2/3/5/7/8/12/13/14/18/20/25/26/28/29/30/38/40/41/48/66/70/71/75/76/77/78/ 79; 4G LTE (CAT 19 DL / CAT 18 UL) LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46; 3G WCDMA: B1/2/4/5/8/19
	Maximum Transmission Data Rate	5G SA Sub-6: Max. 2.4Gbps (DL)/Max. 900Mbps (UL); 5G NSA Sub-6: Max. 3.4Gbps (DL)/Max. 550Mbps (UL) LTE-FDD: Max. 1.6Gbps (DL)/Max. 200Mbps (UL) WCDMA: Max. 42 (DL)/Max. 5.76 (UL)
	Antennas	4 × SMA-K Connectors (Center PIN: SMA Female)
	SIM Slot	2 x (3 V/1.8 V) mini-SIM(2FF) Push-push type slot (SIM Card 2 can be configured with built-in eSIM)
Ethernet Interface	WAN	1 x WAN port (can be configured as LAN) 10/100/1000 Mbps, compliance with IEEE 802.3, IEEE 802.3u, supports auto MDI/MDIX crossover, Ethernet Isolation 1.5 KV RMS
	LAN	3 x RJ45 port, 10/100/1000 Mbps, supports auto MDI/MDIX crossover, Ethernet Isolation 1.5 KV RMS
	PWR	red, always on after powered on
	WORK	green, blinking every 1 second when the router is ready and working properly
Indicators	NET	Mobile network type LEDs NET lights on after device is connected to the network. Green stands for 5G, green and red for 4G, and red for 3G
	SIG	Mobile signal strength indication LED Green represents excellent signal, two-color light represents good signal, red represents poor signal
	WLAN	always solid on when WiFi is enabled and working properly
	WAN	LED blinking When Connection established and data is being transferred over this port.
	LAN	LED blinking When Connection established and data is being transferred over this port.
Wi-Fi Interface	Antennas	2 × SMA-K Connectors (Center PIN: SMA Female)
	MIMO	2×2
	Standards	Concurrent dual-band 802.11a/n/ac (5.8GHz) and 802.11b/g/n (2.4GHz)
	Modes	AP/AP+STA/AP+WDS repeater
	Data speed	Up to 1733Mbps wireless operation rate at 5.8GHz
	Security	Wi-Fi security with WPA-PSK, WPA2-PSK, Mixed WPA/WPA2-PSK, WPA2-PSK+CCMP
	Transmission distance	200 meters by line of sight. Actual transmission distance depends on environment of the site.
GNSS(Optional)	Antenna	1 × SMA-K Connector (Center PIN: SMA Female)
	Technology	GPS, GLONASS, BeiDou, Galileo
	Protocol	NMEA 0183
Power Supply	Adapter	DC 12V/2A
	Connector	DC Power Jack Barrel Type Female 5.5*2.1mm Round socket or industrial terminal block(V+,V-),reverse polarity protection



	Input voltage range	DC9-36V
	Power consumption	Average current 630mA@12V and the maximum current 1.6A@12V
Serial Interface	Numbers	1 × RS485/RS232
	Connector	Terminal block
	Baud Rate(bps)	1200,2400,4800,9600,19200,38400,57600,115200,230400,460800(only 485)
	Signal definition	RS232: TXD, RXD, GND RS485: A, B, GND
	Data bits	7,8
	Stop bits	1,2
	Parity	NONE, ODD, EVEN
Physical	Casing material	Metal shell, ingress protection IP30
Characteristics	Dimensions	125.0*103.0*45.0mm (L*W*H, antenna pedestal, terminal block and DIN Rail are not included)
	Installation	Desktop, wall mounting and DIN-rail mounting
	EMC	Static IEC61000-4-2, level 3 Pulsed Electric Field IEC61000-4-4, level 3 Surge IEC61000-4-5, level 3
	Operating Temperature	-35℃ ~ +75℃
	Storage Temperature	-40°C ~ +125°C (Non-condensing)
	Relative Humidity 0	5%~95% (Non-condensing)
Others	Reload button	1 × Reload
	TBD	Debug interface (TTL Level)
	Ground protection	Screw
	Built-in	Watchdog
Software	Network Protocols	PPP, PPPoE, TCP, UDP, DHCP, ICMP, NAT, HTTP, DNS, ARP, NTP, Telnet, SSH, DDNS, etc.
	VPN	LT2P, PPTP
	Security	Access Control, DMZ, Port Forwarding, SYN-Flood Protection, Filtering (IP& MAC & Domain)
	Management	Web UI, PUSR cloud
	Reliability	WAN Failover, Dual SIM Backup
	Serial port	Transparent (TCP Client/Server, UDP), Modbus Gateway (Modbus RTU to Modbus TCP)
Certificate	In progress	CE, *FCC, *WEEE, RoHS, *RCM, *WPC

1.3. Indicator introduction

USR-G816 provides 6 indicators in total, the specific description is as follows.

Name	Description
PWR	Steady on: power supply is normal. Off: No power supply or abnormal power supply.
WORK	Blinking: The system works normally.
	Green: Signal strength 25-31 (signal strong)
SIG	Orange: Signal strength 15-24 (signal strength is basically normal, and equipment can be used under normal conditions)
	Red: Signal strength 1-14 (Signal strength is weak, please check antenna and the signal strength of current location)

Table 2. LED indicator



WLAN	On: Enable WLAN Off: Enable WLAN
GNSS	Used for GNSS version
NET	Green: 5G network Orange: 4G network Red: 3G network

1.4. Dimension

- > Sheet metal housing, DIN-Rail mounting and wall mounting supported.
- > 125.0*103.0*45.0mm (L*W*H, accessories not included)



Figure 1. Dimension of USR-G816

2. Get Started

2.1. Login router

Power on the G816 router, connect PC to USR-G816 via LAN port or via Wi-Fi, users can login router via Chrome or the other browser. The default network parameters are shown in the following table:

Table 3.	Default network	parameters
----------	-----------------	------------

Parameter Default value



SSID	USR-G816-xxxx
LAN IP	192.168.1.1
Username	root
Password	root
Wi-Fi password	www.pusr.com

Open the browser, enter 192.168.1.1 in the URL blank, and press Enter, it will navigate to the following webpage.

After entering the login password, clicking login, the web page will show configuration page of USR-G816.

USR-G816 × +		~ - @ ×
← → C ▲ 不安全 192.168.1.1 cgi-bin/luci		아 🗟 순 ☆ 🔲 😩 :
USR-G816		
Communication Expert of Industrial IOT		Be Honest, Do Best!
	Authorization Required Please enter your username and password.	
	Username: root Password: ••••	
	Login Reset	
,	iNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 2. Login webpage

2.2. Brief introduction of the webpage

There are several tabs on the left side of the webpage, users can set parameters of USR-G816 on the tab

pages.

- > Status: Mainly display device name, firmware version, running status, and routes etc.
- > Service: Mainly some additional functions, including dynamic DNS, GPS (GPS version), PUSR cloud.
- > VPN: Configuration of VPN, such as PPTP, L2TP and OpenVPN.
- Network: In this interface, there are many categories related to network connection. Users can set parameters such as WAN port, LAN port and cellular network.
- Firewall: User can set firewall rule on this page such as inbound and outbound rules, port forwarding,
 blacklist, whitelist, and other information.
- > DTU: Configure parameters related to DTU such as serial port and SOCKET.
- > System: Mainly some basic functions, including restart, restore factory settings, firmware upgrade,



log checking, etc.

USR IOT Communication Expert of Industrial IOT			Be Honest, Do Best!	
USR-G816	Status			
> Status	System			
> Services	Hostname	USR-G816		
> Network	Firmware Version	V1.0.7.wifi		
> VPN	SN	01302123031600005044		
> Firewall	Local Time	Thu Jul 27 17:38:34 2023		
> DTU	Uptime	1h 4m 11s		
> System	Load Average	0.37, 0.50, 0.65		
> Logout				
	Memory			
	Total Available	112784 kB / 242296 kB (46%)		
	Free	93984 kB / 242296 kB (38%)		
	Cached	13900 kB / 242296 kB (5%)		
	Buffered	4900 kB / 242296 kB (2%)		
	Network			
	IPv4 WAN Status	Type: dhcp Address: 172.16.11.134 ⊮ Netmask: 255.255.254.0 eth Gateway: 172.16.10.1 DNS 1: 192.168.0.1 Connected: 1h 3m 4s		
JINan Usr IOT Technology Limited http://www.pusr.com/				

Figure 3. Status webpage

3. Status & System

3.1. Status

Users can get the basic information of USR-G816, such as firmware version, running time, IPv4 WAN status, routes list, and information about DHCP client.

3.2. System (Hostname)

In this page, users can modify the hostname, the default is USR-G816. After changing, click "Apply", the changed value will take effect.



Communication Expert of In	dustrial IOT	est, Do Best!
USR-G816	System	
> Status	Here you can configure the basic aspects of your device like its hostname or the timezone.	
> Services	System Properties	
> Network	General Settings Design	
> VPN	Hostname USR-G816	
> Firewall		
✓ System		
System	Apply Save	
Administration		
Reboot Timer		
NTP		
Http Port		
Syslog		
Backup/Upgrade		
Reboot		
> Logout		
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 4. Hostname page

3.3. Administration password

This password is used when users login the built-in webpage.

The default login password is root. Users can modify it in this page for secure login.

Communication Expert of In	Austrial IOT Be Honest, Do Best!
USR-G816	Router Password
> Status	Changes the administrator password for accessing the device
> Services	Configuration
> Network	Password Password support numbers, letters and symbols.no more than 16
> Firewall	Confirmation #
✓ System	
System	Anniv
Administration	
Reboot Timer	
NTP	
Http Port	
Syslog	
Backup/Upgrade	
Reboot	
> Logout	
	JiNan Usr 10T Technology Limited http://www.pusr.com/

Figure 5. Administration password



3.4. Reboot timer (Timed restart function)

Users can realize the periodic restart of the router through parameter setting. It can be restarted on a daily, weekly, or monthly basis. Timed restart can regularly clear the operation cache to improve the stability of the router operation.

By default, this function is enabled and the router restarts every Sunday between 4 and 5 AM.

Communication Expert of Indu	Be Honest, Do Best!
USR-G816	Reboot Scheduler
> Status	Reboots the operating system
> Services	Parameter Configuration
> Network	Enable
> VPN	Periodic Reboot Weekly
> DTU	Week Days Sunday
∨ System	Random Time Enable
System	Randomly generate the restart time (hours and minutes) to avoid the device online at the same time. If disabled, custom time is required.
Reboot Timer	
NTP	Kandom Kange(End)
Http Port	Reboot Time 4:25
Syslog	
Backup/Upgrade	Apply Save
	JINan Usr IOT Technology Limited http://www.pusr.com/

Figure 6. Timed restart function

3.5. NTP service

In the time parameter item, it can achieve the function of synchronizing the browser time and the time zone can be set as needed.

In Time Synchronization item, the router can be set to work at NTP client or NTP server. USR-G816 provides 4 configurable NTP server options on webpage.



USR IOT Communication Expert of Ind	Be Hones Autore	st, Do Best!
USR-G816 Status Services Network VPN Firewall DTU System Administration	NTP The Time Synchronization section is used to configure general router time settings, like selecting the local time zone, synchronizing the time and NTP. Time Parameter Current System Time 2023-07-271 17:46:55 Thu Sync with browser Time Zone Asia/Beijing Time Synchronization Enable NTP Client Image: Client Client	
Reboot Timer <u>NTP</u> Http Port Syslog Backup/Upgrade Reboot > Logout	NTP Server Internate NTP Server Intpl.allyun.com It Intml.cloud.tencent.com It Imme.ustc.edu.cn It in.pool.ntp.org It	
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 7. NTP Settings

3.6. HTTP port

The port of logging in the webpage, default is 80, users can modify it in this page.

Communication Expert of Inc	ustial IOT Be Honest, Do Best!
USR-G816	HTTP Port
> Status	Here you can configure the HTTP port number, effective immediately
> Services	Web server
> Network > VPN	Http Port 80 (a) do not set the port in use: 10000 53 22 23 51434
> Firewall	
> DTU	
∽ System	Apply
System	
Administration	
Reboot Timer	
NTP	
Http Port	
Syslog	
Backup/Upgrade	
Reboot	
> Logout	
	JiNan Usr IOT Technology Limited http://www.pusr.com/

Figure 8. HTTP port



3.7. System log

Local log

Users can view the log information and download the log information in this page.

Kernel log level: Debug, Info, Notice, Warning, Error, Critical, Alert and Emergency.

Application log level: Debug, Info, Notice, Warning, Error, Critical, Alert and Emergency.

Communication Expert of Indu	Be Honest, Do Best!
USR-G816	System Log
> Status	Here you can view system logs, including application, kernel, and VPN logs.Remote logs based on UDP protocol can also be configured.
> Services	Configuration
> Network	Local log Remote log
> Firewall	kernel log level Info 🗸
> DTU	Application log level Info 🗸
∽ System	Log Kernel View Empty
System	
Administration	Jul 27 1727/27 (none) kerninto kerneti : 1383.702341 pic 0000:11:00.1; quirk.sprd_por_ereiszebar: barl size bx(0000 Jul 27 1727/27) (none) kerninto kerneti : 1383.702341 pic 0000:11:00.1; quirk.sprd_por_ereiszebar: barl size bx(20000
Reboot Timer	Lui 27 17:272 (Tomis) keminin kemisi (1383:72303) pid 0000:11:00.11:001; quirk_pprd_pd_realseasi. baris ato 5.00000 Lui 27 17:2727 (Tomis) keminin kemisi (1383:72333) pid 0000:11:00.11:001; quirk_pprd_pd_realseasi. baris ato 5.00000
NTP	Jul 27 17:27:27 (none) kerninő kernel: [3183.737043] get_pd_host_memory : smem-info:0x88000000,0x800000 Jul 27 17:27:27 (none) kerninő kernel: [3183.737043] get_pd_host_memory : smem-info:0x8800000,0x300000 Jul 27 17:27:27 (none) kerninő kernel: [3183.737043] get_pd_host_memory : smem-info:0x8800000,0x300000
Http Port	Jul 27 17:27:27 (none) kern.info kernel: [3183.750977] pcl 0000:01:00.0: quirk_sprd_pcl_resizebar: 00 MSL_NEW 0x1cf86502,0x88000003 Jul 27 17:27:27 (none) kern.info kernel: [3183.855664] pcl 0000:01:00.0: quirk_sprd_pcl_resizebar: MSL_MST:0x1cf80000,0x88000003,Joop=0 Jul 27 17:27:27 (none) kern.info kernel: [3183.855664] pcl 0000:01:00.0: quirk_sprd_pcl_resizebar: MSL_MST:0x1cf80000,0x88000003,Joop=0 Jul 27 17:27:27 (none) kern.info kernel: [3183.908220] PCI: busit: Fast back to back transfers disabled
Syslog	Jul 27 17:27:27 (none) kerninfo kernel: [3183.916277] pd 0000-00:00.0. BAB 8: assigned [mem 0x48000000-0x48ffffff] Jul 27 17:27:27 (none) kerninfo kernel: [3183.926657 pd 0000:00:00.0: BAB 0: assigned [mem 0x49000000-1048fffff]
Backup/Upgrade	Jul 27 17:27:27 (none) kern.info kernel: [3183.929567] pi 0000:01:00.0: BAR 0: assigned [mem 0x4800000-0x487ffff pref] Jul 27 17:27:27 (none) kern.info kernel: [3183.937339] pi 0000:01:00.0: BAR 2: assigned [mem 0x4800000-0x487fff pref]
Reboot	Jul 27 11/27:27 (none) kern.info kernel: [3183.943375] pid 0000:01:10:00. EBA 4: assigned [mem 0x48a00000-0x48bfffff] Jul 27 11/27:27:27 (none) kern.info kernel: [3183.951313] pid 0000:01:00:00: EBA 1: assigned [mem 0x48a00000-0x48bfffff]
> Logout	Jul 27 11:27:27 (none) kern.info kernel: [3183.958247] pi 0000:011:00.0: BAB 3: assigned [mem 0x48c20000-0x48c1fff] Jul 27 11:27:27 (none) kern.info kernel: [3183.971038] pi 0000:010:00.0: BAB 3: assigned [mem 0x48c20000-0x48c2fff] Jul 27 11:27:27 (none) kern.info kernel: [3183.971038] pi 0000:000:00.0: bridge to [Duts 01] Jul 27 11:27:27 (none) kern.info kernel: [3183.983479] sprd-pcie-ep-device 0000:11:00.0: ep; probe Jul 27 11:27:27 (none) kern.info kernel: [3183.90438] pi 0000:000:00:00: anabing device (0144 -> 0146) Jul 27 11:27:27 (none) kern.info kernel: [3183.90438] sprd-pcie-ep-device 0000:11:00.0: enabling device (0144 -> 0142) Jul 27 11:27:27 (none) kern.info kernel: [3183.90439] sprd-pcie-ep-device 0000:11:00.0: ep: BAB [[mem 0x48c00000-0x48cfffff] Jul 27 11:27:27 (none) kern.info kernel: [3184.00781] sprd-pcie-ep-device 0000:11:00.0: ep: BAB [[mem 0x48c00000-0x48cfffff] Jul 27 11:27:27 (none) kern.info kernel: [3184.00781] sprd-pcie-ep-device 0000:11:00.0: ep: BAB [[mem 0x48c00000-0x48cffff] Jul 27 11:27:27 (none) kern.info kernel: [3184.00781] sprd-pcie-ep-device 0000:11:00.0: ep: BAB [] [mem 0x48c00000-0x48cffff] Jul 27 11:27:27 (none) kern.info kernel: [3184.00785] sprd-pcie-ep-device 0000:11:00.0: ep: BAB [] [mem 0x48c00000-0x48cffff] Jul 27 11:27:27 (none) kern.info kernel: [3184.00785] sprd-pcie-ep-device 0000:11:00.0: ep: BAB [] [mem 0x48c00000-0x48cffff] Jul 27 11:27:27 (none) kern.info kernel: [3184.012550] sprd-pcie-ep-device 0000:11:00.0: ep: BAB [] [mem 0x48c00000-0x48cffff]
	JiNan Usr 10T Technology Limited http://www.pusr.com/

Figure 9. Local system log

> Remote log

The remote service IP is 0.0.0.0, it means the remote log function is disabled. Users can change the remote service IP and port.

Remote log is based on UDP protocol. The following picture shows how to receive the remote log.



Communication Expert of Inc	ndustial IOT	
USR-G816 Status Services Network VPN Firewall DTU System Administration Reboot Timer NTP Http Port Syslog Backup/Upgrade Reboot Logout	System Log Configuration Configuration Configuration I consider Service DP 19:1161.113 10:00000000000000000000000000000000000	
	JINan Usr IOT Technology Limited http://www.pusr.com/	

Figure 10. Remote system log

3.8. Backup/Upgrade

Download backup: Click "Generate archive" to download a tar archive of the current configuration files.

Restore backup: Click "Browse" to select the backup archive file (Downloaded backup file), and then upload the backup file.

Reset to defaults: Click this button, the USR-G816 will restore to factory default settings.



USR IOT Communication Expert of Industrial IOT	Be Honest
USR-G816	Backup / Flash Firmware
Status Services Network VPN	Backup / Restore Click "Generate archive" to download a tar archive of the current configuration files. To reset the firmware to its initial state, click "Perform reset" . Download backup: Generate archive Reset to defaults: Perform
 Firewall DTU System 	To restore configuration files, you can upload a previously generated backup archive here. Restore backup: Please select file Image: Decomposition of the select file Image:
Administration Reboot Timer NTP Http Port	Flash new firmware image Upload a proper image here to replace the running firmware. Check "Keep settings" to retain the current configuration. Check "Force Upgrade" to force upgrade firmware. Keep settings:
Syslog Backup/Upgrade Reboot	Force Upgrade: Image: Please select file Flash Image
> Logout	
	JINan Usr IOT Technology Limited http://www.pusr.com/

Figure 11. Backup and firmware upgrade

3.9. Reboot

Communication Expert of Inc	ustial IOT Be Hond	est, Do Best!
USR-G816 Status Services Network VPN Firewall DTU VSystem Administration Reboot Timer NTP Http Port Syslog Backup/Upgrade Reboot Logout	System Reboot	
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 12. Reboot Function



4. Network introduction

4.1. WAN interface

On WAN interface page, there are 2 options: WAN_5G and WAN_WIRED. The detail of these 2 options will be

introduced in later chapter.

Communication Expert of Industrie	нот			Be Honest, Do Best!
USR-G816	WAN			
> Status	WAN Overview			
> Services	Network	Status	Actions	
Vetwork	WAN_5G	Uptime: 0h 11m 58s MAC-Address: DE:60:13:C6:CB:A8 RX: 27.40 KB (253 Ptks.) TX: 53.47 KB (401 Ptks.) IPv4: 10.248.1.28/8	🕫 Connect 🔏 Edit	
Cellular Network Network Switch Wireless	WAN WIREE	Uptime: 1h 18m 57s MAC-Address: D4xAD:20:5E:61:71 RX: 98.46 MB (275406 Pitts.) TX: 14.18 MB (27774 Pitts.) IPv4: 172.16.11.134/23	💋 Connect 🛛 🖉 Edit	
WWAN DHCP				
Static Routes				
WAN/LAN Port				
Diagnostics				
> VPN				
> Firewall				
> DTU				
> System > Logout				
		JiNan Usr IOT Technology Limited	http://www.pusr.com/	

Figure 13. WAN interface

4.1.1. WAN_5G interface

This is the same with cellular network. Please check chapter 4.3.

4.1.2. WAN_WIRED interface

> DHCP Client Mode (Default)

The IP address of USR-G816 is assigned by the upper-level router, and the upper-level router must enable the DHCP service. G816 is connected to the WAN port of the upper-level router through the LAN port.



USR IOT Communication Expert of Industrial IOT	Be Hon	est, Do Best! TO REFRESH ON
USR-G816	WAN - WAN_WIRED	
> Status	On this page you can configure the network interfaces. You can bridge several interfaces by ticking the "bridge interfaces" field and enter the names of several network interfaces separated by spaces. You can also use <u>VLAN</u> notation INTERFACE. VLANKE (<u>e.g.</u> : ethe.1).	
Services Network	Common Configuration	
WAN	General Setup	
LAN Cellular Network	Status Uptime: 1h 19m 35s MAC-Address: D4AD:205E61:71	
Network Switch	eth0 K: 100.11 MB (2/80/b Vetks) T: 14.32 MB (2/59/b Vetks) IPv4: 172.16.11.134/23	
WWEIESS	Protocol DHCP client	
DHCP Static Pourtes	Hostname to send when USR-G816	
WAN/LAN Port	requesting DHCP	
Diagnostics	Back to Overview Apply Save	
> Firewall		
> рти		
> System		
> Logout		
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 14. DHCP Client of WAN interface

Static address Mode

In this mode, uses can set the IP address of USR-G816.

Communication Expert of Indu	atrial IOT Be Hon	est, Do Best!
USR-G816	WAN - WAN_WIRED	
> Status	On this page you can configure the network interfaces. You can bridge several interfaces by ticking the "bridge interfaces" field and enter the names of several network interfaces separated by spaces. You can also use <u>VLAN</u> notation INTERFACE. VLANIR (e.g.: etb.0.1).	
✓ Network	Common Configuration	
WAN	General Setup	
LAN	Status Uptime: 0h 27m 26s	
Cellular Network	MAC-Address: D4:AD:20:67:FC:15 RX: 7.15 MB (67736 Pits.)	
Wireless	TX: 22.39 KB (239 PK5.) IPv4: 172.16.10.136/23	
WWAN		
DHCP	Protocol Static address	
Static Routes	IPv4 address	
WAN/LAN Port	IPv4 netmask Please choose	
Diagnostics	IPv4 gateway	
> VPN	IPv4 broadcast	
> Firewall	Use custom DNS servers	
Sustem		
> Logout	Back to Overview Apply Save	
	JINan Usr IOT Technology Limited http://www.pusr.com/	

Figure 15. Static IP of WAN interface

Table 4. Detail parameters of WAN interface



Items	Description
IPv4 address	Should be on the same network segment as the LAN IP of the upper-level router.
IPv4 netmask	Users can choose the options provided by the web page or manually enter the
	subnet mask by themselves.
IPv4 gateway	Fill in the gateway address according to the actual network situation.
IPv4 broadcast	The broadcast address is calculated from the IP address and subnet mask.
Use custom DNS servers	User-defined.

> PPPoE Mode

Fill in the correct username and password given by the operator.



Communication Expert of Indust	alor Be Hone	est, Do Best REFRESHION
USR-G816 > Status > Services	WAN - WAN WIRED On this page you can configure the network interfaces. You can bridge several interfaces by ticking the "bridge interfaces" field and enter the names of several network interfaces separated by spaces. You can also use <u>VLAN</u> notation INTERFACE. VLANIR (e.g.: etb0. 1).	
Vetwork WAN LAN Cellular Network Network Switch	Uptime: 0h 35m 46s Value Uptime: 0h 35m 46s MAC-Address: 0L4A0:20:67:FC:15 RX: 9.09 MB (65418 Pkts.) TX: 29.08 KB (331 Pkts.) Uptime: 10:156/23	
Wireless WWAN DHCP Static Routes WAN/LAN Port Diagnostics	Protocol PPPoE PAP/CHAP username PAP/CHAP password #	
> VPN > Firewall > DTU > System > Logout	Back to Overview Apply Save	
	JiNan Usr IOT Technology Limited http://www.pusr.com/	ſ

Figure 16. PPPoE Mode

4.2. LAN interface

Click the "Edit" button, the settings of the LAN port will be displayed. Users can set general settings like the IP address, gateway etc. The DHCP service of the LAN port is enabled by default, and USR-G816 will automatically assign an IP address to the device connected to the LAN port.

Communication Expert of Industrial IOT				Be Honest, Do Best!
USR-G816	LAN			
> Status	LAN Overview			
> Services	Network	Status	Actions	
 Vetwork WAN LAN 	LAN ぎ (企業業) br-lan	Uptime: 1h 20m 9s MAC-Address: D4:AD:20:5E:61:72 RX: 13:43 MB (74377 Pkts.) TX: 81:74 MB (96562 Pkts.) IPv4: 192.168.1.1/24	# Connect dit	
Cellular Network				
Network Switch				
Wireless				
WWAN				
DHCP				
Static Routes				
WAN/LAN Port				
Diagnostics				
> VPN				
> Firewall				
> DTU				
> System				
> Logout				
		JiNan Usr IOT Technology Limited http://www	.pusr.com/	

Figure 17. LAN interface



Communication Expert of Indust	NOT Be Honest, Do Best
	General Setup
03K-0010	Status Uptime: 0h 52m 57s
Status	MAC-Address: D4AD:20:67;FC:16 RX: 823:46 KB (7535 Pkts.)
Services	TX: 2.73 MB (5541 Pkts.) IPv4: 192.168.1.1/24
✓ Network	
WAN	Protocol Static address
LAN	IPv4 address 192.168.1.1
Cellular Network	IPv4 netmask 255.255.255.0
Network Switch	IPv4 qateway
Wireless	Third broadeset
WWAN	1PV4 broadcast
DHCP	Use custom DNS servers
Static Routes	
WAN/LAN Port	
Diagnostics	DHCP Server
> VPN	General Setup
> Firewall	Ignore interface Disable DHCP for this interface.
> DTU	Start Address 100
System	 Devest leased address as offset from the network address.
Logout	Limit 150
	(a) Maximum number of leased addresses.
	Lessetime 12h
	Jiwan Osr ion rechnology Limited http://www.pusr.com/

Figure 18. Settings of LAN interface

4.3. Cellular network

4.3.1. Configuration

On this page, users can set the basic parameters of the cellular network.

USR-G816 Cellular Network Configuration Settings for APN address, username and password, if you goning to use an APN card, please fill in the form correctly. Effective configuration, earch priority, can improve the network search time. Be sure to fill in the correct configuration, otherwise 5G will be unable to access the Internet.	Í
Status Status Status	
> Services Configuration	
V Network WAN Configuration SIM1 Config SIM2 Config Module Info	
LAN SIM Card Priority None	
Cellular Network 💿 First dial using the selected SIM card, "None" means to record the SIM card, dialed last time and uses it.	
Network Switch Sim Card Switch Enable	
Wireless Trigger Signal Threshold -100dBm -	
WWAN DI	
DHCP Continu Dial Haires 2 Singly value that triggers 5M card switchover(1-50)	
Static Routes Link Detertion Enable SIM185IM2	
WAN/LAN Port	
Diagnostics Detection Intervier 1 40 Detection	
> VPN Detection Full Mumber 4	
Firewall Geneeutive failures to reach this number, dial again (1-100)	
> DTU Detection Address 1 8.8.8.8	
> System Set the first address for ping check	
> Logout Detection Address 2 8.26.56.26	
② Set the second address for ping check	
JINan Usr IOT Technology Limited http://www.pusr.com/	

Figure 19. Basic configuration of cellular network



Items	Description	Default
SIM Card Priority	None: Prioritize the use of the sim card used for the last dial-up.	None
	SIM1: Prioritize using SIM1 to dial up and connect to the Internet.	
	SIM2: Prioritize using SIM2 to dial up and connect to the Internet.	
Sim Card Switch	Enable: Enable automatic SIM switching.	Enable
	Disable: Disable automatic SIM switching.	
Trigger Signal	If the signal value of the currently used SIM card is lower than the	-100dBm
Threshold	set value, G816 will automatically switch to another SIM card.	
Continue Dial	When the number of dialing failures reaches this value, switch to	2
Failures	another SIM card and dial again.	
Link Detection	OFF: Disable the Ping detection.	SIM1&SIM2
Enable (Ping	SIM1: When using SIM1, enable the PING detection.	
detection)	SIM2: When using SIM2, enable the PING detection.	
	SIM1&SIM2: Enable the PING detection Whether using SIM1 or SIM2.	
Detection Interval	Interval of PING detection. Unit: s	10
Detection Fail	If the number of PING attempts exceeds this value, it will redial.	4
Number		
Detection Address 1	The main destination host of PING detection.	8.8.8.8
Detection Address 2	The alternate destination host of PING detection.	8.26.56.26

Table 5. Detail parameters of cellular network

4.3.2. SIM1/SIM2 configuration

The settings of SIM1 can be configured on this page. And the SIM2 configuration is the same with SIM1.



Communication Expert of Inc	Be Hon	est, Do Best!
USR-G816	effective configuration search priority, can improve the network search time. Be sure to fill in the correct configuration, otherwise 5G will be unable to access the Internet.	•
StatusServices	Configuration SIM1 Config Module Info	1
✓ Network WAN	APN Name AutoCheck @ Input your APN Name, 0-62 characters	
LAN Cellular Network Network Switch	User name User name for apn, 0-62 characters Pass Word User password for apn, 0-62 characters	
Wireless WWAN	Auth Type None Control of the second	
DHCP Static Routes	Network Mode AUTO AUTO Note: SG locking network is supported under SA network only	
WAN/LAN Port Diagnostics	SA Enable 5G SA	
> VPN > Firewall	Network Search Priority SG>4G>3G v @ Configuration search priority, can improve the network search time	
> DTU > System	PIN Enable 🗌 () If SIM card enable PIN, enable this function to enter the PIN code	
> Logout	Apply Save	
	JiNan Usr IOT Technology Limited http://www.pusr.com/	Ť

Figure 20. SIM card configuration

Items	Description	Default
APN Name	The SIM card operator provides this parameter.	Auto check
Username	The SIM card operator provides this parameter.	None
Password	The SIM card operator provides this parameter.	None
Auth Type	The SIM card operator provides this parameter.	None
PDP Type	PDP protocol context type.	IPv4
Network Mode	AUTO: According to the on-site network environment, it can automatically	AUTO
	select to stay on the network 5G/4G/3G.	
	3G: Lock the 3G network, if there is no 3G network on site, it will not stay on the	
	network.	
	4G: Lock the 3G network, if there is no 4G network on site, it will not stay on the	
	network.	
	5G(Only SA): If the SIM card supports SA network, locking 5G network is valid.	
SA Enable	If the sim card supports SA network, enable 5G SA. Otherwise, disable the 5G	Enable 5G SA
	SA.	
Network	Network priority selection.	5G>4G>3G

Table 6. Parameters description of SIM card



Search Priority		
PIN Enable	If the SIM card has enabled the PIN function, the USR-G816 also needs to	None
	enable this function also.	

4.3.3. Module information

On this page, user can check some information about the SIM card, like the signal strength, the ICCID, network type etc. The detailed information is shown like the following picture.

Communication Expert of In	dustrial IOT	nest, Do Best!
USR-G816	Effective configuration search priority, can improve the network search time. Be sure to fill in the correct configuration, otherwise 5G will be unable to access the Internet.	^
StatusServices	Configuration Configuration SIM1 Config SIM2 Config Module Info	
✓ Network	Version Number: 86600.1000.00.04.01.17	
WAN	Module SN: FM99PA00QN	
LAN	IMEI Number: 862138050700504	
Cellular Network	Dial SIM: sim2	
Network Switch	SIM Card Status: READY	
Wireless	SIM Card ICCID: 89861122229046156029	
WWAN	Attachment State: Attached	
DHCP Static Douted	Operator Information: CHN-CT	
MAN/LAN Port	Network Type: E-UTRAN(4G)	
Diagnostics	Signal Strength: 35(-105dbm)	
> VPN	IP Address: 10.244.3.176	
> Firewall	Location Area Code: 5277	
> DTU	Confidence Interval: 8C38485	
> System		
> Logout	Apply Save	
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 21. Information of cellular network

4.4. Network switch

In this interface, users can choose network priority. The default is to use the WAN port network first.



Communication Expert of Inc	ustrial KOT	Be Honest, Do Best!
USR-G816	Network Switch	Î
> Status	Configure the network switc	hing function.
> Services	Configuration	
✓ Network	Priority	ETH>Cellular>STA v
WAN	Reference Mode	Custom
Cellular Network	Primary Server	114.114.114
Network Switch	Secondary Server	P or Domain; such as '114.114.114' or 'baidu.com'
Wireless	Secondary Server	(P or Domain, such as*114.114.114.114.114*or*baidu.com*
DHCP	Thirdly Server	
Static Routes WAN/LAN Port	Ping Interval	P or Domain, such as 114, 114, 114, 114, 017 baldu.com
Diagnostics	Package size	100 32-1024Bytes
> Firewall	Timoout	2000
> DTU	Threout	100-20000milliseconds
> System		
> Logout		Apply Save
		JiNan Usr IOT Technology Limited http://www.pusr.com/

Figure 22. Network switch page

4.5. Wireless (Wi-Fi)

4.5.1. Wi-Fi settings of 2.4 & 5.8G

Users can set Wi-Fi related information on this page.

Communication Expert of Inc	Autrial IOT	Be Honest, Do Best! NATORARESHON
USR-G816	Wireless Settings	Î
Status	Wireless Settings	
> Services		
✓ Network	2.4G Settings 5.8G Setti	Ings Client Information
WAN	Status	Mode: Master
LAN		SSID: USK-G876-6177 BSSID: D4AD:20:5E:61:73
Cellular Network		Channel: 1 (2412 GHz) Tx-Power: 20 dBm
Network Switch		
Wireless	Enable	
WWAN	Hide SSID	
DHCP	SSID	USR-G816-6171
Static Routes	Encryption	mixed-psk 🗸
WAN/LAN Port	Key	
Diagnostics		
Firewall	HW Mode	Ing Ing If STA is enabled, the configuration is affected by STA.
> DTU	Channel	auto
> System		If STA is enabled, the configuration is affected by STA.
> Logout	HT Mode	HT40 v If STA is enabled, the configuration is affected by STA.
	Regions	CN - China 🗸
192.168.1.1/cgi-bin/luci/;stok=bda5f1aa7d6794c	da763d66d92f37a72f/admin/network/wireless?tab.wireless.wifi0=wlan0	JiNan Usr IOT Technology Limited http://www.pusr.com/

Figure 23. 2.4G & 5.8G Wi-Fi settings



Items	Description	Default
Enable	To choose whether to enable the Wi-Fi function.	Enable
Hide SSID	To choose whether to hide the SSID.	Disable
	If the SSID is hidden, the user cannot search for the Wi-Fi	
	name on the mobile phone or PC. Users can connect to Wi-Fi	
	by manually entering the SSID.	
SSID	Wi-Fi name, users can modify as needed.	USR-G816-xxxx/_5.8G
Encryption	To choose Wi-Fi encryption method.	Mixed-psk
Кеу	The password of Wi-Fi.	www.pusr.com
HW Mode	To choose Wi-Fi standard.	11ng
Channel	To choose Wi-Fi channel.	auto
HT Mode	To choose high throughput.	HT40
Regions	This option is for 5.8G Wi-Fi.	00-World

Table 7. Parameters description of Wi-Fi interface

4.5.2. Client information

On this page, the users can view the device information connected to the USR-G816 through Wi-Fi.

Communication Expert of Industrial IOT							Be Hor	I e s t , NTO REFRESH O
USR-G816								
	Wireless Settings							
> Status	Wireless Settings							
> Services								
✓ Network	2.4G Settings 5.8G Set	ettings Client Information						
WAN	SSID	MAC-Address	IPv4-Address	Signal	Noise	RX Rate	TX Rate	
LAN	d USR-G816-6171	C8:94:02:7F:EA:53	192.168.1.182	-31 dBm	-94 dBm	192.0 Mbit/s	400.0 Mbit/s	
Cellular Network								
Network Switch								
Wireless			Apply	Save				
WWAN								
DHCP								
Static Routes								
WAN/LAN Port								
Diagnostics								
> VPN								
> Filewall								
> Diu								
> logout								
Logodt								
		JiNan Usr IOT Technology Li	mited http://ww	w.pusr.com/				

Figure 24. Client information of Wi-Fi



4.6. WWAN(STA)

4.6.1. Basic settings

On this page, users can enable the STA function. Users can choose 2.4G Wi-Fi or 5.8G Wi-Fi. The default

setting is OFF.

Communication Expert of Industrial IOT	Be Honest, Do Best Auto Refression
USR-G816	WWAN Settings
> Status	When enabling the STA, make sure that the AP corresponding to the device is enabled. After the STA is successfully connected, the channel, bandwidth and mode of the AP of the device will be synchronized to the same as the STA.
> Services	
✓ Network	Basic Settings 2.4G Settings 5.8G Settings AP Information
WAN	
LAN	STA Switch STA_2.4G
Cellular Network	
Network Switch	Apply Save
Wireless	
WWAN	
DHCP	
Static Routes	
WAN/LAN Port	
Diagnostics	
> VPN	
> Firewall	
> DTU	
> System	
> Logout	
	JiNan Usr IOT Technology Limited http://www.pusr.com/

Figure 25. Choose 2.4G or 5.8G Wi-Fi

4.6.2. 2.4G / 5.8G settings

The steps to connect to the upper-level routers:

1>Click "Scan" button,



Communication Expert of Industrie	Be Honest, Do B
USR-G816	WWAN Settings When enabling the STA, make sure that the AP corresponding to the device is enabled. After the STA is successfully connected, the channel, bandwidth and mode of the AP
 Status Services 	of the device will be synchronized to the same as the STA
Vetwork	Basic Settings 5.86 Settings AP Information
LAN Cellular Network	Scan Scan Scan WIFI-STA V
Network Switch Wireless	Encryption No Encryption
WWAN	network wwan0 wan0
Static Routes	Enable Ping Check
WAN/LAN Port Diagnostics	Apply Save
> VPN	
> DTU	
> System	
> Logout	
	JiNan Usr IOT Technology Limited http://www.pusr.com/

Figure 26. Scan AP information

2> Click the drop-down button of SSID, the available Wi-Fi network is displayed. Users can select the Wi-Fi network or enter the Wi-Fi name to connect to.

3>Enter the password of the Wi-Fi network if needed.

4>Choose network type:

Wwan0: Relay mode.

LAN: Bridge mode, the DHCP service should be closed, and the LAN IP should be in the same segment of upperlevel router.



Communication Expert of Industry	ialor Be Hor	NUTO REFRESH ON
USR-G816 Status Services Vetwork UAN LAN Cellular Network Mireless WWAN DHCP Static Routes WAN/LAN Port Diagnostics VPN Firewall DTU System Logout	WWAN Settings We nearly the STA, make sure that the AP corresponding to the device is enabled. After the STA is successfully connected, the channel, bandwidth and mode of the AP of the device will be synchronized to the same as the STA. Statistics AP Information Statistics AP Information Statistics AP Information Statistics Con Statistics Con Con Statistics Con Con Statistics Con Con	
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 27. Searched AP list

4.6.3. AP information

If the USR-G816 connect to upper-level Wi-Fi successfully, the information will be displayed in this page.

Communication Expert of Indu	strial IOT					Be H	onest, Do Best!
USR-G816	WWAN S	ettings					
> Status	when enabled of the device	ing the SIA, make sure that the AP corre e will be synchronized to the same as the	sponding to the device is enab STA.	bled. After the STA is suc	cessfully connected, the	channel, bandwidth and mode of the A	٢
Services Network	Basic Settin	gs 2.4G Settings 5.8G Settings	AP Information				
WAN	SSID	MAC-Address	Signal	Noise	RX Rate	TX Rate	
Cellular Network	🚽 产品部	3E:6A:48:15:DE:86	-76 dBm	-97 dBm	108.0 Mbit/s	120.0 Mbit/s	
Network Switch							
Wireless			_				
WWAN			Appl	y Save			
DHCP							
Static Routes							
WAN/LAN Port							
Diagnostics							
> VPN							
> Firewall							
> DTU							
> System							
> Logout							
		JiNan Usr IOT Techno	logy Limited http://v	www.pusr.com/			0

Figure 28.



4.7. DHCP introduction

On this page, users can assign static IP addresses to specific network devices and define device hostnames.

Communication Expert of Indu	trial IOT Be Hon
USR-G816 Status Services Vetwork	DHCP and DNS DHCP list information and Static Lease Static leases are used to assign fixed IP addresses and symbolic hostnames to DHCP clients. They are also required for non-dynamic interface configurations where only hosts with a corresponding lease are served.
WAN LAN Cellular Network Network Switch	Active DHCP Leases IPv4-Address MAC-Address Leasetime remaining VSR-FEUWTMNMYOU 192.168.1.182 c8.94.02.7fea.53 11h 49m 10s USR-FEUWTMNMYOU 192.168.1.115 c8.5acct.af.68.4b 10h 20m 32s
Wireless WWAN DHCP Static Routes	Static Leases Hostname MAC_Address IPv4-Address This section contains no values yet
WAR/LAN Port Diagnostics > VPN > Firewall > DTU	New rule: Hostname MAC-Address New rule Itry: Address
> System > Logout	Apply Save
	JiNan Usr IOT Technology Limited http://www.pusr.com/

Note: Up to 10 rules can be added.

Figure 29. DHCP rules

4.8. Static routes

4.8.1. Static routing adding

Static routing describes the routing rules for packets on Ethernet.

Note: Up to 100 static router rules can be added.



Communication Expert of Industrial IOT					Be Hoi
USR-G816	Static Routing				
> Status	To find information or	n static routing configurat	ion, refer to the figure and table below		
> Services	Static Routing Ro	outing Table			
✓ Network	Static IPv4 Routes				
WAN	Interface	Target	IPv4-Netmask	IPv4-Gateway	Metric
LAN					
Cellular Network	This section contains no	values yet			
Network Switch					
Wireless	New Rule:				
WWAN	Interface	Target	IPv4-Netmask	IPv4-Gateway	Metric
DHCP		Host-IP or Network	If target is a network		
Static Routes	lan y				bba (*
WAN/LAN Port					- Add
Diagnostics					
			Apply	Save	
DTU					
Dio					
Logout					
		liNan Hsr IQT To	chnology Limited http://www.	nusr.com/	

Figure 30. Static routing rule

ltems	Description	Default
Interface	Network interface of the target network.	
Target	Destination network address.	LAN
IPv4	A netmask is used to divide an IP address into sub-networks (subnets).	None
Netmask	Combined, the 'Netmask' and 'Target' values define the exact destination	
	network or IP address to which this route applies.	
IPv4	A gateway can be any machine in a network that is capable of serving as an	None
Gateway	access point to another network. Traffic that matches this route will be directed	
	over the IP address specified in this field.	
Metric	The metric value acts as a measurement of priority. If a packet about to be	None
	routed matches two or more rules, the one with the lower metric is applied.	

Table 8. Parameters description of static routing

4.8.2. Routing table

All routing rules are displayed on routing table page.



Communication Expert of Industrial IC	ਸ							Ве Но	
USR-G816 Status Services	Static Routing To find information on static routing configuration, refer to the figure and table below Static Routing Provides Table								
✓ Network	Destination	Gateway	Netmask	Flags	Metric	Ref	Use	Interface	
VVAN	0.0.0.0	172.16.10.1	0.0.0.0	UG	0	0	0	eth0	
Cellular Network	0.0.0.0	172.16.10.1	0.0.00	UG	5	0	0	eth0	
Network Switch	0.0.0.0	10.0.0.1	0.0.0.0	UG	10	0	0	pcie0	
Wireless	10.0.0.0	0.0.0.0	255.0.0.0	U	10	0	0	pcie0	
WWAN	10.0.0.1	0.0.0.0	255.255.255.255	UH	10	0	0	pcie0	
DHCP	172.16.10.0	0.0.0.0	255.255.254.0	U	5	0	0	eth0	
Static Routes	172.16.10.1	0.0.0.0	255.255.255.255	UH	5	0	0	eth0	
WAN/LAN Port	192.168.1.0	0.0.0.0	255.255.255.0	U	0	0	0	br-lan	
Diagnostics									
VPN			Apply	Save					
Firewall									
DTU									
System									
Logout									
		Figure 31.	Routing table	checking					

4.9. WAN/LAN port switching

USR-G816 is equipped with 1* WAN/LAN port which is WAN port by default. And this port can be set to LAN

port on this page.

USR IOT Communication Expert of Int	Industrial 107 Be Honest,	Do Best!
USR-G816	WAN/LAN Port setting	
> Status	Setting the Work Mode of Ethernet Port 1(WAN/LAN);	
> Services	Configuration	
✓ Network	Mode of Ethernet Port 1	
WAN		
LAN	WAN/LAN WAN	
Cellular Network		
Network Switch		
Wireless	Apply Save	
WWAN		
DHCP		
Static Routes		
WAN/LAN Port		
Diagnostics		
> VPN		
> Firewall		
> DTU		
> System		
> Logout		
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 32. WAN/LAN switching setting



4.10. Network diagnostics

USR-G816 provides online diagnostic functions, including Ping tools, routing analysis tools, and DNS viewing tools.

Communication Expert of Industrial IOT				Be Honest, Do Best!
USR-G816	Diagnostics			
> Status > Services	Network Utilities	114.114.114	www.baidu.com	
✓ Network WAN	PING 114 114 114 114 (114 114 114 1	Traceroute 14): 56 data bytes	Nslookup	
LAN Cellular Network	64 bytes from 114.114.114.114.114. 64 bytes from 114.114.114.114: seq= 64 bytes from 114.114.114.114: seq= 64 bytes from 114.114.114.114: seq=	+7). 30 Gala Gytes ttl=69 time=6.051 ms ttl=70 time=6.051 ms ttl=81 time=6.005 ms ttl=81 time=6.003 ms		
Wireless	64 bytes from 114.114.114.114: seq=4 114.114.114 ping statistics 5 packets transmitted, 5 packets receiv round-trip min/ava/max = 5.913/6.108	ttl=73 time=6.271 ms ed, 0% packet loss /6.303 ms		
DHCP Static Routes				
WAN/LAN Port Diagnostics				
> VPN > Firewall > DTU				
> System > Logout				
	JiNan U	Isr IOT Technology Limited http://www.pus	sr.com/	

Figure 33. Network diagnostics

Items	Description	Default value
Ping	Users can ping a specific IP address directly on the router	8.8.8.8
	side.	
Traceroute	Routing analysis tool, which can obtain the routing path	8.8.8.8
	passed when accessing an address.	
Nslookup	A DNS viewing tool that can resolve domain names to IP	www.google.com
	addresses.	

5. VPN

5.1. PPTP Client

Point-to-Point Tunneling Protocol (PPTP) is a type of VPN protocol that uses a TCP control channel and a Generic Routing Encapsulation tunnel to encapsulate PPP packets.



USR IOT Communication Expert of Ind	lustrial KOT	Be Honest, Do Best!
USR-G816	PPTP Setting	
> Status	PPTP Parameters	
> Services	PPTP Client	Enable Disable
> Network	Server Address	192.168.0.2
✓ VPN	Interface	auto v
РРТР		Q Auto refers used default route interface to connect
L2TP	User Name	
VPN Status	Password	<i>\$</i>
> Firewall	Remote Subnet	192.168.55.0
> DTU		@ eg: 192.168.10.0
> System	Remote Subnet Mask	255.255.255.0
> Logout		@ eg: 255.255.0, if empty, the default value is 255.255.255.0
	NAT	
	Enable MPPE Encryption	
	MTU	1450
		60~1450
	Extra option	
		Accerd pool actions Non - professional careful modification
	Enable Static Tunnel IP Address	
		· · · · · · · · · · · · · · · · · · ·
		JiNan Usr IOT Technology Limited http://www.pusr.com/

Figure 34. PPTP VPN settings

ltems	Description	Default
PPTP Client	Turns the PPTP client on or off.	Off
Server Address	Set PPTP server IP or domain name.	192.168.0.2
Interface	Select the interface according to different networking methods.	auto
Username	Username used for authentication to the PPTP server. They are	None
/Password	provided by the VPN server.	
Remote Subnet	These are the IPv4 client-side networks that will be routed to this	192.168.55.0
	client specifically using route, so that a site-to-site VPN can be	
	established.	
Remote Subnet Mask	Subnet mask of remote client network.	255.255.255.0
NAT	Network address translation. It's a way to map multiple private	Enabled
	addresses inside a local network to a public IP address before	
	transferring the information onto the internet.	
Enable MPPE	This option must be consistent with the VPN server.	Enabled
Encryption		
MTU	The MTU value of the PPTP channel must be consistent with the	1450

Table 10. Parameter details of PPTP VPN



	VPN server.	
Extra option	Append pppd parameters, non-professionals, prohibited	None
	operation.	
Enable Static	Users need to enter static IP manually if this option is enabled.	Disabled
Tunnel IP		
Address		
Default Gateway	Force all client generated traffic through the tunnel, except WAN	Disabled
	protocol is PPPOE.	
Enable Ping	The USR-G816 will reconnect to PPTP server if the PING command	Disabled
	fails more than preset times.	
Ping Period	The time interval between two ping commands.	10
Ping times	Number of ping attempts.	3

5.2. L2TP Client

L2TP, also called Layer 2 Tunneling Protocol, is a tunneling protocol used to create VPN connections. Its main purpose is to securely transport data over public networks.

USR IOT Communication Expert of Industri	ial lot	Be Honest, Do Best!
USR-G816	L2TP Setting	
> Status	L2TP Parameters	
Services	L21P Client Server Address	Enable O Disable
VPN	Interface	auto v
PPTP L2TP	User Name	Value refers used default route interface to connect
VPN Status	Password	<i>a</i>
> Firewall	Tunnel Name	
> System	Tunnel Password	6 6 6 6 6 6 6
> Logout	Remote Subnet	192.168.55.0 eg: 192.168.100
	Remote Subnet Mask	255.255.255.0 @ eg: 255255255.0
	NAT	
	MTU	1450 i 600-1450
	Extra option	
		Append pppd options, Non - professional, careful modification
		JiNan Usr IOT Technology Limited http://www.pusr.com/

Figure 35. L2TP VPN settings





L2TP Client	Turns the L2TP client on or off.	Off
Server Address	Set L2TP server IP or domain name.	192.168.0.2
Interface	Select the interface according to different networking methods.	auto
Username/ Password	Username used for authentication to the PPTP server. They are	192.168.55.0
	provided by the VPN server.	
Tunnel Name	The name of L2TP tunnel.	None
Tunnel Password	The password of L2TP tunnel.	None
Remote Subnet	These are the IPv4 client-side networks that will be routed to this	192.168.55.0
	client specifically using route, so that a site-to-site VPN can be	
	established.	
Remote Subnet Mask	Subnet mask of remote client network.	255.255.255.0
NAT	Network address translation. It's a way to map multiple private	Enabled
	addresses inside a local network to a public IP address before	
	transferring the information to the internet.	
MTU	The MTU value of the PPTP channel must be consistent with the	1450
	VPN server.	
Extra Option	Append pppd parameters, non-professionals, prohibited	None
	operation.	
Enable Static Tunnel	Users need to enter static IP manually if this option is enabled.	Disabled
IP Address		
Default Gateway	Force all client generated traffic through the tunnel, except WAN	Disabled
	protocol is PPPOE.	
Enable Ping	The USR-G816 will reconnect to PPTP server if the PING command	Disabled
	fails more than preset times.	
Ping Period	The time interval between two ping commands.	10
Ping times	Number of ping attempts.	3

5.3. OpenVPN

In OpenVPN mode, the USR-G816 support 3 OpenVPN clients and 1 OpenVPN server. This means USR-G816 can connect to 3 OpenVPN servers simultaneously.


S USR IOT	rial IOT					Be Hor
USR-G816	OpenVPN Conf Enhanced OpenVPI	iguration N design allows 3 OpenVPN Cl	lients and 1 OpenVPN Server	r		
Services	OpenVPN Confi	guration Type	Description	Enable	Status	
V VPN	CLIENT_1	CLIENT		OFF 🗸	Disconnected	Edit
L2TP OpenVPN	CLIENT_2	CLIENT		OFF 🗸	Disconnected	Z Edit
Certificate Management VPN Status	CLIENT_3	CLIENT		OFF V	Disconnected	☑ Edit ☑ Edit
> Firewall > DTU				Apply		
> System > Logout				() pppy		
		JiNan Usr IOT Tect	nnology Limited htt	p://www.pusr.com/		

Figure 36. Edit OpenVPN settings

5.3.1. OpenVPN client

USR-G816 supports import .ovpn config file and PKCS#12 cert-file. Say goodbye to complex parameter settings. After importing the ovpn file, users just need to config the username and password.

USR IOT Communication Expert of Indu	itrial IOT	Be Honest, Do Best!
USR-G816	CLIENT_1 - OpenVPN	Configuration
> Status	Configuration	
 Services Network 	Enable	
V VPN	Description	The maximum length is 50 Bytes.
PPTP L2TP	Enable OpenVPN Config from file	● on ○ off
OpenVPN	OpenVPN Config File	选择文件 未选择任何文件
Certificate Management VPN Status	User name	Username used for authentication to the VPN server. It is needed when Authentication Type contains Username/Password.
> Firewall > DTU	Password	 Password used for authentication to the VPN server. It is needed when Authentication Type contains Username/Password.
> System	Interface	auto Auto refers used default route interface to connect
Logoat	Log Level	warning(3) Cog Level-0-11
	Extra Option	
		In content nere will be written unetuy to une configuration nie, vease hill in carefully
	Local Route - LAN IP a	ddress and subnet mask of the remote network.
		Subnet Nationask JiNan Usr IOT Technology Limited http://www.pusr.com/

Figure 37. Upload OpenVPN Config file



If users need to set parameters using traditional way, just turn off the config file. The ca, cert, and key file can be loaded in "Certificate Management" page.

Communication Expert of Indus	trial IOT		Be Honest, Do Best!
	Configuration		•
USR-G816	Enable	ON •	
> Status	Description	(2) The maximum length is 50 Bytes	
> Services > Network	Enable OpenVPN Config from file	⊖ On .● Off	
V VPN	Protocol	UDP 🗸	
РРТР	Remote Host IP Address	192.168.0.2	
L2TP	Dest	1194	
OpenVPN	Port	1171	
Certificate Management	Authentication Type	SSL/TLS Y	
VPN Status	TUN/TAP	TUN 🗸	
> Firewall	Тороlоду	Subnet 🗸	
> DTU	Interface	auto 🗸	
> System		Auto refers used default route in	erface to connect
> Logout	redirect-gateway		
	NAT		
	Enable Keepalive		
	Ping detection interval	10	
		Ping remote once every n second Ping remote once every n second	s over TCP/UDP port.
	ping-restart n	120 Restart if n seconds pass without	recention of remote ning.
		public interest worker	×
	L	iNan Usr IOT Technology Lin	ited http://www.pusr.com/

Figure 38. Enable traditional OpenVPN settings

USR IOT Communication Expert of Indus	Be Honest, Do Best	
USR-G816 > Status > Services > Network VPN PPTP L2TP OpenVPN Certificate Management VPN Status > Firewall > DTU > System > Logout	Certificate Management The current page is used to centrally manage various certificate and key files related to OpenVPN Client1 Certificate PKCS12(p12) BRC2(F) + 地球年町の文件 Certificate Password Type call (BR2C)F) + 地球年町の文件 Legy (BR2C)F) + 地球年町の文H Legy (BR2C)F) + 地球任町の文H Legy (BR2C)F) + 地球任町の文H	
	Client2 Certificate pkcs12(.p12) 透辉文件 未选择任何文件 @ PKCSH12 (P12) files define an archive file format for storing cryptographic objects as a single file. It means that .p12 file is able to contain ca & cert & key. Generally if you have a .p12 file already, there is no need to upload ca & cert & key one by one. ca	Ţ
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 39. Upload certificate file



5.3.2. OpenVPN server

Communication Expert of Indus	tia IOT	Be Hones	t, Do Best!
USR-G816	SERVER_1 - OpenVPN	PN Configuration	
> Status	Configuration		
> Services	Enable	le OFF 🗸	
> Network	Description	n	
✓ VPN		@ The maximum length is 50 Bytes.	
РРТР	Enable OpenVPN Config from file	ig Not Support	
L2TP	Deste sel		
OpenVPN	Protocol		
Certificate Management	Port	rt 1194	
VPN Status	Authentication Type	e SSL/TLS V	
> Firewall	TUN/TAP	p TUN 🗸	
> DTU	Topology	Subnet	
> System	ropology		
> Logout	Client Subnet	at	
	Client Netmask	ik	
	Renegotiation Interval(s)	s) 3600	
	max clients	16	
		② Allow a maximum of n simultaneously connected clients.	
	Client to client	nt 🗹 🔞 Internally route client-to-client traffic.	
	Duplicate certificates	15 is allows multiple clients to connect using the same certificates.	
	j	JiNan Usr IOT Technology Limited http://www.pusr.com/	0

Figure 40. OpenVPN server settings

6. Firewall

6.1. General Settings

There are 2 firewalls by default in USR-G816.

Communication Expert of Industrial IOT		Be Honest, Do Best!
USR-G816 Status Services Network VPN Firewall General Settings Port Forwards Traffic Rules Access Restrictions DTU System	Firewall - Zone Settings The firewall creates zones over your network interfaces to control network traffic flow. General Settings Enable SYN-flood Protection Drop invalid packets Input accept Forward accept	
> Logout	Zones=>Forward Source Zone=>Destination zones Input Output Forward Masquerading MSS Ian: [an: [an: [an: [an: [an: [an: [an: [i clamping
	JiNan Usr IOT Technology Limited http://www.pusr.com/	



Figure 41. General settings of firewall

- > Input: Packets that accessing router's IP.
- > Output: Packets sent from the router.
- > Forward: Data forwarding between interfaces, without routing itself.
- Masquerading: IP masquerading automatically, which is meaningful for the WAN port and 5G port, the masquerading for IP when access the external.
- > MSS clamping: Limit the large of the MSS, generally it is 1460.

The first rule:

- > The input, output, and forward packet from LAN to WAN is accept by default.
- Forward: If the data package will access the WAN from the LAN, so the rule allows data package from the LAN to WAN.
- > Input: Open the webpage of the router when you under the LAN.
- > Output: The router accesses the extern net, like NTP.

The second rule:

- > WAN and 5G interface receive the input, output and forward packet by default.
- If there is input data package and it will be allowed. Such as someone will login the webpage of the router from the WAN.
- Same as the input, the output will be allowed if access the external net from the WAN or 4G of the router.
- > The forward package is also allowed, data packets from the WAN port want to be forwarded to the LAN.

6.2. Port forward

6.2.1. Port forward

A port forward is a way of making a computer on your home or business network accessible to computers on the internet, even though they are behind a router or firewall.

Up to 100 port forwards can be added.

Items	Description	Default
Name	The name of port forwarding rules, user-defined.	None
Protocol	Protocol type, options: TCP+UDP, TCP, UDP.	TCP+UDP
External Zone	WAN or VPN.	WAN

Table 12. Parameter details of port forward



External port	Users can set a single port or a range of ports, like 8000-9000.	None
	Note: It's DMZ function when external port and internal port	
	are empty.	
Internal zone	LAN or VPN.	LAN
Internal IP	IP address of device connected to LAN port.	None
address		
Internal port	Users can set a single port or a range of ports, like 8000-9000.	None
	Note: It's DMZ function when external port and internal port	
	are empty.	

			Be Hon
Firewall - Port Forward Port forwarding allows remot	is te computers on the Internet to connect to a specific compu	ter or service within the private LAN.	
Port Forwards Name	Match Rules	Forwarding To	Enable Sort
	This section contain	ns no values yet	
New Port Forwarding Rules:	Protocol External External port zone	Internal Internal IP Internal port zone address	
New port forward	TCP+UDP v wan v	lan V V	Add
		_	
	liNan Hsr IOT Technology Limited http://www	w nuss com/	
	Firewall - Port Forward Port Forwarding allows remot Port Forwards Name New Port Forwarding Rules: Name New port forward	Frewall - Port Forwards Det nowarding allows remote computers on the Internet to connect to a specific computers Name Match Rules Internet forwarding Rules: Name Nam	Fireward Forwarding allows encode computers on the internet to connect to a specific computer or service with the prior to a specific comp

Figure 42. Port forwards settings

6.2.2. DMZ function

DMZ function is a physical or logical subnet that separates a local area network (LAN) from other untrusted networks -- usually, the public internet.



USR IOT Communication Expert of Indust	Be Hone	est, Do Bes
USR-G816	Firewall - Port Forwards Port forwarding allows remote computers on the Internet to connect to a specific computer or service within the private LAN.	
Services Network VPN	Port Forwards Name Match Rules Forwarding To Enable Sort	
 Firewall General Settings Port Forwards 	This section contains no values yet New Port Forwarding Rules:	
Traffic Rules Access Restrictions > DTU	Name Protocol External External port zone Internal Internal Internal Internal Internal port DMZ TCP+UDP van v Ian 192.168.1.15 v	
> System > Logout	Apply Save Leave it blank	
	JiNan Usr IOT Technology Limited http://www.pusr.com/	



6.3. Traffic rules

The Traffic Rules tab is a crucial feature of a firewall functionality that allows you to set rules to filter and control network traffic moving through the device. In essence, traffic rules determine which firewall rules will be applied to packets traveling through the network. These packets can be allowed, blocked, or rejected based on various criteria such as the source and destination IP addresses and port numbers specified in the packet headers.

Items	Description	Default
Enable	Whether to enable the traffic rules.	
Name	The name of traffic rules.	None
Restrict to	IP address family to which to rule will apply.	IPv4 only
address family	It only supports IPv4 IP by now.	
Protocol	tocol Choose the protocol of the traffic rules, including TCP+UDP, TCP, UDP, ICMP	
Match ICMP type	Choose the ICMP type of the rules.	any
Source zone	The zone to which the third party will be connecting.	lan
Source MAC	MAC address(es) of connecting hosts.	any

Table 13. Parameter d	letails of traffic rules
-----------------------	--------------------------



	The rule will apply only to hosts that match MAC addresses specified in this		
	field. Leave empty to make the rule skip MAC address matching.		
Source IP	IP address or network segment used by connecting hosts.	any	
Source port	IP address or network segment used by connecting hosts.	None	
Destination zone	Target zone of the incoming connection.	WAN	
Destination IP	Tagert IP address or network segment of the incoming connection.	any	
Destination port	Tagert port or range of ports of the incoming connection.	None	
Action	Action that is to be taken when a packet matches the conditions of the rule.	Accept	
	Drop: packet is stopped and deleted.		
	Accept: packet gets to continue to the next chain.		
	Reject: packet is stopped, deleted and, differently from Drop, an ICMP packet		
	containing a message of rejection is sent to the source from which the dropped		
	packet came.		
	Don't track: packet is no longer tracked as it moves forward.		

Communication Expert of Inc	Be Hon
USR-G816 Status Services Network	Firewall - Traffic Rules Traffic rules define policies for packets traveling between different zones, for example to reject traffic between certain hosts or to open WAN ports on the router. Traffic Rules Name Protocol Action Enable
VPN Firewall General Settings Port Econverds	Allow- Ping To any router IP on this device Accept input I Company Control of Company Company Control of C
Traffic Rules Access Restrictions	Open ports on router: Name Protocol External port New input rule TCP+UDP TCP+UDP
> System	New forward rule: Name Source zone Destination zone New forward rule Ian Vent el Add and edit
	Source NAT Name Protocol Action Enable Sort This section contains no values yet
	JiNan Usr IOT Technology Limited http://www.pusr.com/

Figure 44. Traffic rules settings interface

6.3.1. Open ports on router

This provides a quick way to set simple rules that allow traffic on specified ports of the device. The figure



below is an example of the Open ports on device section and the table below provides information on the fields contained in that section.

Items	Description	Default
Name	The name of the rule, user defined.	None
Protocol	Specifies to which protocols the rule should apply, including TCP+UDP, TCP,	TCP+UDP
	UDP.	
External port	Specifies which port(s) should be opened.	None

Table 14.	Parameter	details
-----------	-----------	---------

SR IOT nmunication Expert of Industrial IOT					Be Honest, D
P-C816	Allow- Ping	reve-rcmp wan type echo-request From any hostin wan To any router IP on this device	Accept input		Edit 🗶 Delete
		Any TCP,UDP From any host in lan To any host in wan	Accept forward) Edit 💌 Delete
5	-	Any TCP,UDP From any host in lan To any host in wan	Accept forward	•• •] Edit 💌 Delete
ork	-	Any tcp, udp From any host in wan To any router IP on this device	Accept input	•• 2	Edit 🗶 Delete
	-	Any TCPUDP From any host in Ian To any host in wan	Accept forward	••	Edit 🗶 Delete
ral Settings	Open ports on router:				
orwards	Name	Protocol External port			
: Rules is Restrictions	New input rule	TCP+UDP 🗸			
_	New forward rule:				
ut.	Name	Source zone Destination zone			
at	New forward rule	lan 🗸 wan 🗸 🖻 Add and edit			
	Source NAT				
	Name	Protocol		Action	Enable Sort
		This section contains no v	lues yet		
	Now course NAT-				
		JiNan Usr IOT Technology Limited http://www.pusr	com/		

Figure 45.

6.3.2. Add new forward rule

This is used to create firewall rules that control traffic on the FORWARD chain. The figure below is an example of the Add New Forward Rule section and the table below provides information on the fields contained in that section.

Table 15.	Parameter	details
-----------	-----------	---------

Items	Description	Default
Name	The name of the rule, user defined.	None



Source zone	The zone from which traffic has originated.	lan
Destination zone	The zone to which traffic will be forwarded to.	wan

Communication Expert of Industr	al IOT				Be Ho
	Allow- Ping	From any host in wan To any router IP on this device	Accept input	🗹 🔹 🔸 🛃 Edit	× Delete
058-0010		Any TCPUDP From any host in Ian To any host in wan	Accept forward	🖉 🔹 💌 🛃 Edit	X Delete
Status Services		Any TCPUDP From any host in lan To any host in wan	Accept forward	🖬 🔹 💌 🌌 Edit	X Delete
> Network	-	Any tcp, udp From any host in wan To any router IP on this device	Accept input	🛛 🔹 🛃 🗹 Edit	X Delete
> VPN ~ Firewall	-	Any TCPUDP From any host in lan To any host in wan	Accept forward	🛛 🔹 🔹 🗹 Edit	X Delete
General Settings	Open ports on rou	ter:			
Port Forwards	Name	Protocol External port			
Traffic Rules	New input rule	TCP+UDP 🗸			
DTU					
System	New forward rule:				
> Logout	Name	Source zone Destination zone			
	New forward rule	lan 🗸 wan 🖌 🖻 Add and edit			
	Source NAT				
	Name	Protocol		Action	Enable Sort
		This section contains no	o values yet		
	New course NAT				
		JiNan Usr IOT Technology Limited http://www.pu	sr.com/		

Figure 46. Add new forward rules

6.3.3. Source NAT

Source NAT (SNAT) is a form of masquerading used to change a packet's source address and/or port number to a static, user-defined value. SNAT is performed in the POSTROUTING chain, just before a packet leaves the device.

Up to 100 SNAT rules can be added.

Items	Description	Default
NameThe name of the rule, user defined.N		None
Source zone	Matches traffic originated from the specified zone.	lan
Source zone	Matches traffic destined for the specified zone.	wan
To source IP	Matches traffic destined for the specified zone.	None
To source port	Matches traffic destined for the specified zone.	None

Table 16. Brief parameters of Source NAT



Communication Expert of Industrial IOT		Be Ho
	To any host in wan	
USK-G810 Open ports or	router:	
Name Name	Protocol External port	
> Services New input rul	TCP+UDP 🗸	
> Network		
> VPN New forward	ile:	
✓ Firewall Name	Source zone Destination zone	
General Settings New forward	ule Ian 🗸 wan 🗸 🖻 Add and edit	
Port Forwards		
Traffic Rules Source NA		
Access Restrictions Name	Protocol	Action Enable Sort
> System		
> Logout	This section contains no values yet	
New source N	I:	
Name	Source zone Destination zone to source in to source port	
New SNAT ru	lan v wan v Please choc Do not rewrite	Add and edit
	Apply Save	
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 47. Settings of SourceNAT

After clicking the "Add and edit" button, it will redirect you to the rule's configuration page.

USR IOT Communication Expert of Indust	nial KOT	Be Honest, Do Best!
USR-G816	This page allows you to char	And advanced properties of the traffic rule entry, such as matched source and destination hosts.
> Status	Enable	Disable SNAT
> Services	Protocol	TCP+UDP
> Network > VPN	Source zone	○ lan: lan: 過意意
✓ Firewall General Settings		wan: wan_wired: 2 wan_5g: 2 wwan0: 2
Port Forwards	Source IP address	any Only match incoming traffic from this IP or range.
Traffic Rules Access Restrictions	Source port	any Match incoming traffic originating from the given source port or port range on the client host.
> DTU	Destination zone	● lan: lan: 是 素 魚
> System > Logout		O wan: wan_wired: 🛃 wan_5g: 💥 wwan0: 🗶
	Destination IP address	Destination ip or ip range.
	Destination port	any Oestination port or port range.
	SNAT IP address	172.16.10.136 (etho)
	SNAT port	Remite mainte venit to ure gren exartss.
		Rewrite matched traffic to the given source port. May be left empty to only rewrite the IP address.
	Ϊ	Nan Usr IOT Technology Limited http://www.pusr.com/

Figure 48. Detail settings of SourceNAT



Items Description Default



Enable	Whether to turn on the rule.	Disable
Name	The name of the rule, user defined.	None
Protocol	Specifies to which protocols the rule should apply, including TCP+UDP, TCP,	TCP+UDP
	UDP, ICMP.	
Source zone	Matches traffic originated from the specified zone.	LAN
Source IP	Mathes traffic originated from specified IP address or network segment.	any
Source port	Mathes traffic originated from specified port number.	None
Destination zone	Mathes traffic originated from specified port number.	wan
Destination IP	Matches traffic destined for the specified IP address or network segment.	None
Destination port	Matches traffic destined for the specified port number.	None
SNAT IP	Changes matched traffic packet source IP address to the value specified in	None
	this field.	
SNAT port	Changes matched traffic packet source port number to the value specified	None
	in this field.	

6.4. Access restrictions

Access restrictions implement access restrictions on specified domain names, and support blacklist and whitelist settings for domain name addresses. When blacklist is selected, devices connected to the router cannot access the blacklisted domain names, and other domain name addresses can be accessed normally. When the whitelist is selected, the devices connected to the router can only access the domain names in the white list, and other domain names cannot be accessed normally. Both the blacklist and the whitelist can be set with multiple entries, and this function is disabled by default.



Communication Expert of Industrial IOT			Be Hor
USR-G816	Access Restrictions		
> Status	Enter the domain name keyword, such as www.baidu.com.Note If the access fails, please revisit.	: When setting the whitelist, the PC may fail to visit the white	elist site for the first time due to browser reasons.
> Services > Network	Configurations		
> VPN	Method Close V		
General Settings			
Port Forwards	Name	Domain Name	Enable
Traffic Rules Access Restrictions		This section contains no values yet	
> DTU > System	New Firewall Rule:		
> Logout	Name	Domain Name	
	New rule		🎦 Add
		Appiy Save	
	JiNan Usr IOT Technology Li	imited http://www.pusr.com/	

Figure 49. Access restrictions interface

6.4.1. Blacklist settings

First, select the blacklist, enter the name of the rule and the prohibited domain address, and then click Add, and the added rules will be displayed in the list. Click Apply and the rules take effect immediately. Devices connected to the router will not be able to access the domain address just added. If blacklist is selected but no rules are added, the default blacklist is empty, that is, all domain names can be accessed. As shown in the figure, except www.baidu.com and www.google.com, other domain names can be accessed normally.



Communication Expert of Indus	Be Hones	st, Do Best!
Communication Expert of Indue USR-G816 Status Services Network VPN Firewall General Settings Port Forwards Traffic Rules Access Restrictions DTU System Logout	A NOT A Access Restrictions Enter the domain name keyword, such as www.baidu.com.Note: When setting the whitelist, the PC may fail to visit the whitelist site for the first time due to browser reasons. I the access fails, please revisit. Method Black List Method Black List Method Comain Name Enable blacklist www.baidu.com Enable blacklist www.googie.com Delete Delete	
	JiNan Usr iOT Technology Limited http://www.pusr.com/	

Figure 50. Add blacklist rules

6.4.2. Whitelist settings

Select the whitelist, enter the name of the rule and the domain address that is allowed to be accessed, and then click Add, and the added rules will be displayed in the list. Click Apply and the rules take effect immediately. Devices connected to the router will not be able to access the domain address except the ones in the rule. If you select the whitelist but do not add a rule, the default whitelist is empty, that is, all domain address cannot be accessed. As shown in the figure, the device can access Baidu.



Communication Expert of Industrial IOT				Be Hone
USR-G816	Access Restrictions			
> Status	Enter the domain name keyword, such as www. If the access fails, please revisit.	ubaidu.com.Note: When setting the whitelis	st, the PC may fail to visit the whitelist s	ite for the first time due to browser reasons.
Services Network	Configurations			
> VPN Firewall 	Method White List	~		
General Settings Port Forwards	Name	Domain Name	Enable	
Traffic Rules Access Restrictions	blacklist	www.baidu.com		🗷 Delete
> DTU	New Firewall Rule:			
> Logout	Name		Domain Name	
	New rule			Add
		Apply	Save	

Figure 51. Add whitelist rules

7. DTU Function

USR-G816 comes with 1*RS232/485 serial port, through simple settings, the serial device can be connected to the network and achieve data communication with the remote server. There are 3 work mode for DTU function: NET, HTTPD, MODBUS.

- NET: In this mode, the user does not need to pay attention to the data conversion process between the serial port and the network and can realize the data transparent communication between the serial port device and the designated network server.
- HTTPD: In this mode, data communication between the serial device and the HTTP server can be realized. USR-G816 can pack the data from serial device into HTTP format and send it to HTTP server, or parse the data returned by server and send it to the serial device.
- MODBUS: In this mode, USR-G816 can realize Modbus RTU/TCP conversion between the serial port device and the designated network server.

Note: In NET and MODBUS mode, SOCKA, B, C, D can be used, but the HTTPD mode cannot be used at the same time.



7.1. General settings

7.1.1. Protocol selection

Users can choose the work mode as needed. The "Restarting without data" function is off by default.

USR IOT Communication Expert of Indu	ustrial IOT Be Hone	est, Do Best!
USR-G816	DTU Setup	
> Status	DTU General Configurations	
> Services	Configurations	
> Network	Protocol Format Select Heartbeat Packet Registry Packet Advanced Setting	
> VPN	Type	
> Firewall	Restarting Without Data OFF	
General Settings		
Serial Port Settings		
SOCKET	Apply Save	
HTTPD		
> System		
Logout		
	JINan Usr IOT Technology Limited http://www.pusr.com/	

Figure 52. General settings of DTU function

If we turn on the "Restarting without data" function, there are two parameters:

Table 18.	Parameters	of restarting	without data
-----------	------------	---------------	--------------

Items Description		Default
Reconnect Detection	If the USR-G816 does not receive the data sent by the server for	3600 seconds
Interval(s)	more than pre-set seconds, it will actively reconnect to the server.	
	Pre-set value range: 1-3600s.	
Restart Detection	If the USR-G816 does not receive the data sent by the server for	36000 seconds
Interval(s) more than pre-set seconds, it will restart.		
Pre-set value range: 60-36000s.		



Туре	NET Y	
Restarting Without Data	ON Y)
Reconnect Detection Interval(s)	3600 ange: 1-3600	
Restart Detection Interval(s)	36000 2 range: 60-36000	

Figure 53. Settings about restarting without data

7.1.2. Heartbeat packet

When USR-G816 works in TCPC or UDPC mode, it can actively send heartbeat packet information to the remote server, which is convenient for the server to judge whether USR-G816 is still online.

Communication Expert of Inc	dustrial IOT Be Hones	t, Do Best!
USR-G816	DTU Setup	
> Status	DTU General Configurations	
> Services	Configurations	
> Network	Protocol Format Select Heartbeat Packet Registry Packet Advanced Setting	
> Firewall	Enable OFF 🗸	
✓ DTU	Type Network Heartbeat Packet 🗸	
General Settings	User-Defined Packet 0123456789	
Serial Port Settings	Choose custom is effective The allowed characters are: A-F, a-f, 0-9, hex data, even bit	
SOCKET	Heartbeat Interval 3 O 1-6000 Seconds	
System		
> Logout		
	Apply Save	
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 54. Settings of heartbeat packet

7.1.3. Registration packet

The remote server can distinguish different data sources by registering package information, to process the received data.



Communication Expert of Inc	ndustrial IOT Be Hones	t, Do Best!
Communication Expert of Inc USR-G816 Services Network VPN Firewall General Settings Serial Port Settings SOCKET HTTPD System Logout	DTU Setup DTU General Configurations Configurations Protocol formal Select Heartbeat Packet Registry Packet Contained in Atter Connection Apply Sare	
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 55. Settings of registration packet

Table 19.	Parameter	details o	f registration	packet

Items	Description	Default			
Enable	De Master switch of registration packet function.				
	ON: Enable registration packet function.				
	OFF: Disable registration packet function.				
Туре	User-defined: Uses define the registration package content.	User-defined			
	ICCID: The registration package content is ICCID information.				
	IMEI: The registration package content is IMEI information.				
	PUSR.				
User-Defined	The content of registration packet. Only valid for user-defined registration	0123456789			
Packet	packet type. Hex format.				
Registry Packet	After connection: Send the registration packet information only once after	After connection			
Contained In	the socket connection is established.				
	Prefix of data: Add registration packet information in front of each packet				
	of data sent by the serial device.				



7.1.4. Advanced settings (AT command password)

The password of network AT command. We will introduce it in later chapter.

Communication Expert of Int	lustrial IOT	est, Do Best!
USR-G816 USR-G816 Services Network VPN Firewall Connection Settings Serial Port Settings SocKET HTTPD System Logout	DTU Setup DTU General Configurations Configurations Protocol format Select Heartbeat Packet Advanced Setting Command Header test.cn# Apply Save	
	JiNan Usr 10T Technology Limited http://www.pusr.com/	

Figure 56. AT command password

7.2. Serial port settings

7.2.1. Parameter description

Communication Expert of Inc	lustrial IOT		Be Ho	nest, Do Best!
USR-G816	Serial Port Settings			
> Status	The basic settings of serial p	ort		
> Services	Configuration			
> Network	Baud Rate	115200 🗸		
> Firewall	Data Bits	8 ~		
✓ DTU	Stop Bits	1 ~		
Serial Port Settings	Pairty	NONE		
SOCKET	Packaging Interval	10 ~ (2) 10-60000 milliseconds		
HTTPD	Packaging Length	1000 V		
> Logout				
			Apply Save	
		JiNan Usr IOT Technology Limited	http://www.pusr.com/	



Figure 57. Serial port settings

Items	Description	Default
Baud Rate	Baud rate of serial port. This parameter needs to be consistent	115200
	with the serial device.	
	Options: 1200, 2400,4800, 9600, 19200, 38400, 57600, 115200,	
	230400, 460800.	
Data Bits	Data bits of serial port. This parameter needs to be consistent	8
	with the serial device.	
	Options: 7, 8	
Stop Bits	Stop bits of serial port. This parameter needs to be consistent	1
	with the serial device.	
	Options: 1, 2	
Parity	Parity of serial port. This parameter needs to be consistent with	None
	the serial device.	
	Options: None, Odd, Even	
Packeting Interval	If the time interval between two adjacent bytes exceeds the set	10ms
	value, it will be divided into two packets and sent.	
	10~60000ms	
Packeting Length	When the length of the data packet reaches the set value, it will	1000 Bytes
	be sent out.	
	5-1500 Bytes	

Table 20. Parameter description of serial port

7.2.2. Packeting mechanism

Packeting by time

When G816 receives data from UART, it will constantly check the interval time between two adjacent bytes. If the interval time is greater than or equal to a certain "time threshold", it is considered that a data frame is over, otherwise data is received until it is greater than or equal to the packet length (default is 1000 bytes). Send this frame of data as a TCP or UDP packet to the network side. The "time threshold" here is the packing interval. The range that can be set is 10ms~60000ms. The factory default is 10ms.

This parameter can be set according to AT command, AT+UARTFT=50.







Packeting by length

When G816 receives data from UART, it will constantly check the number of bytes received. A frame is considered complete if the number of bytes received reaches a certain "length threshold". Send this frame of data as a TCP or UDP packet to the network side. The "length threshold" here is the packing length. The range that can be set is 5~1500 bytes. The factory default is 1000 bytes.

This parameter can be set according to AT command, AT+UARTFL=<length>.



Figure 59. Packeting mechanism by length

7.3. SOCKET

When the USR-G816 work at NET or MODBUS mode, users need to set the parameters on this page.



Communication Expert of Ind	dustrial IOT	Be Honest, Do Best!
USR-G816 Status Services Network VPN Firewall OTU General Settings Serial Port Settings SocKET HTTPD	Socket Settings Socket Basic Settings Configuration SocketA Parameters SocketB Parameters SocketC Parameters SocketD Parameters SocketA Parameters SocketA Parameters SocketA Parameters SocketA Parameters SocketA Disable • • SocketA • • Operating Mode TCPC • Address test.cn • • UDPS mode does not need to set up the server address • Port 2317	
> System > Logout	Registry Packet Enable Enable v Need enable DTU Setup->Registry Packet Apply Save	
	JiNan Usr IOT Technology Limited http://www.pusr.com/	

Figure 60. Settings of socket

Table 21. Parameters d	escription of socket
------------------------	----------------------

Items	Description	Default
Socket A	Enable: Enable socket A communication.	Disable
	Disable: Disable socket A communication.	
Operating Mode	TCPC: TCP client mode.	ТСРС
	TCPS: TCP server mode, Support simultaneous access to 8 clients	
	(Only for SOCKA).	
	UDPC: UDP client mode.	
	UDPS: UDP server mode.	
Address	For TCPC and UDPC mode, it's the IP address of remote server.	test.cn
	For TCPS and UDPS mode, it's no practical meaning.	
Port	For TCPC and UDPC mode, it's the listening port of remote server.	2317
	For TCPS and UDPS mode, it's the listening port of USR-G816.	
Registry Packet Enable	This switch button is used together with the function in "General	Enable
	Settings" .	
	Enable: Enable the registration packet function corresponding to	
	the socket.	



Disable: Disable the registration packet function corresponding	
to the socket.	

7.4. HTTP Client

When USR-G816 works at HTTPD mode, users need to set the parameters on this page.

Items	Description	Default
Request Method	Support 2 methods: GET and POST	GET
Remove Header	ON: Parse the HTTP message returned by the server, and then	ON
	output the payload to the serial port.	
	OFF: Output the full http message returned by the server	
	directly to the serial port.	
HTTP URL	The URL information of HTTP server	/1.php[3F]
Server Address	HTTP server address.	test.cn
Remote Port	The listening port of the HTTP server.	80
Timeout	If the set time is exceeded, the connection with the HTTP server	10
	will be disconnected. Range: 10~60s	
Httpd Header	Header information of HTTP protocol.	Accept: text/html[0D][0A]

Table 22. Parameter description of HTTP



Communication Expert of Industrial II	от			Be Hor	est, Do Best!
Communication Expert of Industrial IV USR-G816 Status Services Network VPN Sriewall OTU General Settings SOCKET HTTPD System Logout	TTPD Settings HTTPD Bask Settings Configuration Request Method Remove Header HTTP URL Server Address Remote Port Timeout Httpd Header	GET ON /1.php[3F] test.cn 80 10 1-60 Seconds Accept:text/html[0D][0A]	Apply Save		
		JiNan Usr IOT Technology Limited	http://www.pusr.com/		

Figure 61. Settings of HTTPD

7.5. Modbus gateway setting and test

1> Enable MODBUS mode,

	Services	Configurations					
	Network	Protocol Format Select	Heartbeat Packet	Registry Packet	Advanced Setting		
	VPN						
	Firewall	Туре	MODBUS	~			
~	DTU	Restarting Without Data	OFF	~			
[General Settings						
	Serial Port Settings						
	Figure 62. Enable MODBUS						

2> Set Socket A settings,



\rightarrow	Status	*						
	Services	Config	juration					
	Network	SocketA	Parameters	SocketB Parameters	SocketC Paramet	ers SocketD Pa	rameters	
	VPN		Cask	et A Enable	~	-		
>	Firewall		SOCK	SocketA	•			
~	DTU		Operating Mo	ode TCPS	~			
	General Settings			502				
	Serial Port Settings		ŀ	Port 502		J		
(SOCKET							
	HTTPD				_			
>	System					Apply Save		

Figure 63. Modify settings of socket

3> Set Modbus poll software,

ස්ථු Modbus Poll - Mbpoll1	- 🗆 ×
File Edit Connection Setup Functions Display View Medeus Hele	×
Connection Mbpoll1 Tx = 0: Err = 0: ID = 1: F = 03: SR = 10 No connection Alias 00000 0 1 0 2 0 3 0 4 0 5 0 Remote Modbus Server P Address or Node Name 192.168.1.1 Server Port Connect Timeout 502 3000	OK Cancel Mode ORTU ASCII Response Timeout 1000 [ms] Delay Between Polis 20 [ms]
For Help, press F1.	[172.16.10.35]: 23

Figure 64. Modify settings of Poll

4> Set Modbus slave software,

a3 Modbus Slave - Mbslave1		_	\times
File Edit Connection Setup Display View Window	Connection Setup X		
Image: Second	Connection Serial Port Cancel Serial Settings USB-SERIAL CH340 (COM15) USB-SERIAL CH340 (COM15) I15200 Baud Mode I15200 Baud Interpretation Interpretation Row Control Interpretation Interpretation		
For Help, press F1.	Port 4: 1'	15200-8-N-1	

Figure 65. Modify settings of Poll

5> Test result.

âi N	/lodbus Slave - [l	Mbslave1]	법을 Modbus Poll - Mbpoll1
Fi D I	le Edit Connec	tion Setup Display Vi	Eile Edit Connection Setup Functions Display View Window E
ID = '	1: F = 03		Mbpoll1
	Alias	00000	Tx = 17: Err = 0: ID = 1: F = 03: SR = 1000ms
0	Temp	35	Alias 00000
1	Humidity	46	35
2		0	1 46
3		0	2 0
4		0	3 0
5		0	4 0
6		0	5 0
7		0	
8		0	
9		0	
Ear He	No. proce E1		footble and f

Figure 66. Modbus test result

7.6. Transparent data communication

1> Net mode setting,



> Network		
> VPN	Configurations	
> Firewall	Protocol Format Select Heartbeat Packet Registry Packet Advanced Setting	
✓ DTU	Type NET ~	
General Settings		
Serial Port Settings	Restarting Without Data OFF ~	
SOCKET		
HTTPD		
> System	Apply Save	

Figure 67. Enable NET mode

2> Socket settings,

/	INETWOLK					
	VDN	SocketA Parameters	ocketB Parameters	SocketC Parameters	SocketD Parameters	
	VEIN					
	Firewall	SocketA	Enable	~		
~	DTU		SocketA			
	General Settings	Operating Mode	ТСРС	~		
	Serial Port Settings	Address	192.168.1.115			
	SOCKET		UDPS mode does	not need to set up the serve	r address	
	HTTPD	Port	2317			
	System	Registry Packet Enable	Enable	~		
>	Loaout		Provide the second s	Setup->Registry Packet		

Figure 68. Modify settings of socket



3> Test result.

Figure 69. Data communication result



8. Additional services

8.1. PUSR Cloud

8.1.1. Add USR-G816 on PUSR Cloud

PUSR platform login address: https://mp.usriot.com/.

On USR-G816 side, users need enable the PUSR cloud first.

USR IOT Communication Expert of Indu	rial IOT	Be Honest, Do Best!
USR-G816	USR Cloud	
> Status	Usr Cloud	
✓ Services	enable 🗹	
USR Cloud		
DDNS		
Phtunnel	Configurations	
> Network	Traffic flow record interval 10	
> VPN	 les 	ss than 12 hours
> Firewall	Traffic flow report interval 30	ee than 12 hours and late than 40 statistics ourlas of traffica
> DTU		a shar na noora shina naa sharanaa yeeda oo xumee
> System	Net Status record interval 5	ss than 12 hours
> Logout	Net Status report interval 20	
	i i i i i i i i i i i i i i i i i i i	ss than 12 hours and less than 40 statistics cycles of net status
	Heartbeat Interval 30	v
	Udp Configuration	
	UDP Heartbeat Interval 20s	v
	JiNa	n Usr IOT Technology Limited http://www.pusr.com/

Figure 70. Enable the PUSR function of G816

On PUSR cloud side, users can add USR-G816 on PUSR platform and monitor the status of USR-G816.



*	USR Cloud Conso	ole									 service support user rigit 	nts 🚯 简体中文 👧 1558	8836112
	Quick start	Gateway	r management > Gate	eway list									
ē	Screen management	Gatewa	ay list				Total Gate 6	ways Onli	ine gateway • Offline 6	gateway			
	Scene management∕	Pleas	e enter SN or ga	Query Advanced Searc	th						Add Delete	Transfer gateway More	
G	Device management						parameter loc	Number of as			Single Add		
Ð	management		Gateway status	Gateway name	SN	Gateway model	ĸ	ces	Firmware Version Belonging organiz		Gar Batch Add	Operation	
	Gateway list Batch configuration		Waiting for the initi	未命名_网关名称_54	00005450000000000004	未知型号	-	1	-	根组织	Seattle, Washington, United States	View Edit Delete More	
	Firmware upgrade		Offline	USR-G816	01302323060800000979	USR-G816w-G	-	0	V1.0.10.wifl-EN	PUSR	美莲广场, Jinan Shi, Shandong 2501	View Edit Delete More	
2	Configuration \checkmark management		Waiting for the initi	Unnamed_Gateway na	00005450000000000003	未知型号	-	0	-	PUSR	山东曾济南市历下区坤顺路	View Edit Delete More	
щ	Data center 🛛 🗸	· _	Waiting for the initi	Unnamed_Gateway na	00005450000000000001	未知型号	-	0	-	PUSR	山东會济南市历下区坤顺路	View Edit Delete More	
₽	Alarm linkage 🛛 🗸		Offline	未命名_网关名称_84	01301822120100009921	USR-G806s-EAU	-	0	V1.0.03.C165818.01-E	根组织	山东曾济南市历下区坤顺路	View Edit Delete More	
	Value-Added services		Offline	USR-M100	02700123031600055984	USR-M100	-	1	V2.0.03.000000.0000	根组织	Swatch Jinan Mixc, East Jingshi Ro	View Edit Delete More	
▣	Maintenance management										Total 6 10/page \vee Pre	1 Next Go to 1	
♦	Extend Y												
Ŀ	юТ												
	10.0.1												
	V6.U.1												

Figure 71. Add device on PUSR cloud

*	USR Cloud Conso	le	O service support	🔋 user rights	🚯 简体中文	155	88836112
	Quick start	Gateway management -> Gateway list -> Add Gateway					
ē	Screen management	Add Gateway					
	Scene management*	Please note that there are duplicate gate way names (which will not affect the subs					
୯	Device management	equent steps, and you can continue to ad d gateways)					
æ	Gateway	* Belonging organize PUSR ~					
	Gateway list	* SN @ 0130232 SN does not support, click here					
	Batch configuration	* MAC / IMEI 866371					
N	Configuration ~	Positioning method Manual positioning Automatic positioning					
щ	Data center 🗸	Gateway address 1221 4th Avenue, Seattle, Washington 96101, United States Map					
<u>n</u>	Alarm linkage 🛛 🗡	Tag 🐵 Add tags					
© ©	Value-Added servicës Maintenance	Network					
\$	management Extend ^v	moreoung					
Ŀ	IoT						
		Save					
	V6.0.1						

Figure 72. Enter the information of USR-G816



*	USR Cloud Conso	ole										nts 🔇 简体中文 👩 15588836112	
	Quick start	Gatewa	Gateway management > Gateway list										
21	Screen management	Gatev	vay list				Total Gater 5	vays • Onlir 1	offline 4	gateway			
	Scene management*	Plea	ise enter SN or ga	Query Advanced Searc	ch .						Add Delete Transfer gateway More		
e	Device management						naramatar loc	Number of as					
þ	management		Gateway status	Gateway name	SN	Gateway model	k	sociated devi ces	Firmware Version	Belonging organize	Gateway address	Operation	
	Gateway list Batch configuration		Online	USR-G816	01302323060800000979	USR-G816w-G	-	0	V1.0.10.wifi-EN	PUSR	美莲广场, Jinan Shi, Shandong 2501	View Edit Delete More	
	Firmware upgrade		Waiting for the initi	Unnamed_Gateway na	00005450000000000003	未知型号		0		PUSR	山东省济南市历下区坤顺路	View Edit Delete More	
Z	Configuration \checkmark management		Waiting for the initi	Unnamed_Gateway na	00005450000000000001	未知型号	-	0	-	PUSR	山东曾济南市历下区坤顺路	View Edit Delete More	
<u>111</u>	Data center 🛛 🗸		Offline	未命名_网关名称_84	01301822120100009921	USR-G806s-EAU	-	0	V1.0.06-EN	根组织	山东省济南市历下区坤顺路	View Edit Delete More	
₾	Alarm linkage 🛛 🗡		Offline	USR-M100	02700123031600055984	USR-M100	-	1	V2.0.03.000000.0000	根组织	Swatch Jinan Mixc, East Jingshi Ro	View Edit Delete More	
	Value-Added services										Total 5 10/page \vee Pre	1 Next Go to 1	
▣	Maintenance ~ management												
\$	Extend 🗸												
Ŀ	IoT												
	V6.0.0												

Figure 73. Online status

8.1.2. Gateway Information

Click "Gateway Name", it will guide you to a new page showing the detail of the USR-G816.

*	USR Cloud Conse	le	介 service support ♥ user rights ⑤ 簡体中文 15588836112
s	Quick start	Gateway management -> Gateway list -> Gateway Details	
⊵	Screen management	Gateway Details Network debugging Parameter configuration	
Ŷ	Scene management∕	Gateway infomation	
ତ	Device management?	USR-C\$16 0130232369800000979	
∞	Gateway	Belonging organize PUSR Gateway model: USR-G816w-G	Bettery level:
	Gateway list	Gateway address: 美运广场, Jinan Shi, Shandong 250101, China MAC: D4AD2067FC15	Networking type: Ethernet
	Batch configuration	Tag: IMEI: 868371050583497 NID:	signal intensity:
	Firmware upgrade	Firmware Version: V1.0.10.wif-EN	
ß	Configuration	Hardware version: V1.0	
ш	Data center 🗸 🗸	Gateway traffic monitoring	
£	Alarm linkage 🛛 🗸	© 2023-08-13 19:27:51 To 2023-08-14 19:27:51 Cuery	
G	Value-Added services	-O- Main gateway(-)	
	Maintenance	Bytes/kb	
⊜	management		
♦	Extend ~		
Ŀ			
	V6.0.0		



Users can also send AT command to query parameters of USR-G816



ጵ	USR Cloud Conso	le	Q service support	🔮 user rights	⑦ 简体中文	155	588836112
	Quick start	Gateway management >> Gateway list >> Gateway Details					
2	Screen management	Gateway Details Network debugging Parameter configuration					
	Scene management⁄	General information					
(°)	Device management ^y Gateway management Gateway list	Gateway USR-G816 Gateway 013023206080000979 name: SN: Belonging PUSR Gateway USR-G816w-G organize: model: Frmmvare V1.0 10 wif-EN					
	Batch configuration Firmware upgrade	Version: Parameter debugging					
5	Configuration management						
<u></u>	Data center						
8	Value-Added services						
▣	Maintenance ~ management	+WANN DHCP:172:16:10:136,0:0:0				C	₹ -Q
♦	Extend Y	¥					3
	ют	useful Gateway restart Query version Reload to factory settings AT+WANN Send				0	کر _
	V6.0.0						

Figure 75. Parameters query and config

8.1.3. Remote access

After the USR-G816 is launched on the PUSR platform, you can remotely log in to the built-in webpage through the PUSR platform to view and modify parameters.

ጵ	USR Cloud Conso	ole									⊖ service support 😗 user rig	ihts 🔇 i	简体中文 , 15588836112
	Quick start	Gateway management > Gateway list											
2	Screen management	Gatev	vay list				Total Gater 5	ways • Onlin	e gateway • Offline 4	gateway			
	Scene management⁄	Plea	ise enter SN or ga	Query Advanced Sear	ch						Add Delete Transfer gateway More		
୯ ଅ	Device management [*] Gateway management		Gateway status	Gateway name	SN	Gateway model	parameter loc k	Number of as sociated devi ces	Firmware Version	Belonging organize	Gateway address	Operatio	on
	Gateway list		Online	USR-G816	01302323060800000979	USR-G816w-G	-	0	V1.0.10.wifi-EN	PUSR	美莲广场, Jinan Shi, Shandong 2501	View	Edit Delete More
	Firmware upgrade		Waiting for the initi	Unnamed_Gateway na	00005450000000000003	未知型号	-	0	-	PUSR	山东曾济南市历下区坤顺路	View	Disable
ß	Configuration management		Waiting for the initi	Unnamed_Gateway na	00005450000000000001	未知型号	-	0	-	PUSR	山东省济南市历下区坤顺路	View	Configuration page
ш	Data center 🛛 🗸	^	Offline	未命名_网关名称_84	01301822120100009921	USR-G806s-EAU		0	V1.0.06-EN	根组织	山东省济南市历下区坤顺路	View	Firmware Upgrade Reboot gateway
۵	Alarm linkage 🛛 🗡		Offline	USR-M100	02700123031600055984	USR-M100	-	1	V2.0.03.000000.0000	根组织	Swatch Jinan Mixc, East Jingshi Ro	View	
	Value-Added services										Total 5 10/page \vee Pre	1	Next Go to 1
▣	Maintenance management												
♦	Extend ~												
	107												





USR-G816	n an
Communication Expert of Industrial IOT	Be Honest, Do Best!
	Authorization Required Please enter your username and password.
	Username: root Password: Login Reset
ЛІ	n Usr IOT Technology Limited http://www.pusr.com/

Figure 77. Login page

8.1.4. Firmware upgrade

Users can also upgrade firmware via PUSR platform.

*												its 🚯 简体中文 🌘	
	G	ateway	management > Gate	eway list									
	G	atewa	y list				Tota	il Gateways Onlin	e gateway • C	ffline gateway			
			e enter SN or ga	Query Advanced Searc	:h	Firmware Upgrad	e		×		Add Delete	Transfer gateway	More
						* Task Name	Firmware Upgrade						
			Gateway status	Gateway name	SN	* Gateway name	USR-G816			Belonging organize	Gateway address	Operation	
				USR-G816	013023230	* Gateway model	USR-G816w-G			PUSR	美莲广场, Jinan Shi, Shandong 2501	View Edit Delete	More
			Waiting for the initi	Unnamed_Gateway na	000054500	* Firmware	Pelase ChooseFirmware Upgrade	Version		PUSR	山东省济南市历下区坤顺路	View Edit Delete	More
			Waiting for the initi	Unnamed_Gateway na	000054500	Upgrade Version				PUSR	山东省济南市历下区坤顺路	View Edit Delete	More
	<		Offline	未命名_网关名称_84	013018221	* Task Time	O 2023-08-14 19:34:48 T	2023-08-15 19:34:48		根组织	山东省济南市历下区坤顺路	View Edit Delete	More
			Offline	USR-M100	027001230		0			根组织	Swatch Jinan Mixc, East Jingshi Ro	View Edit Delete	More
								Cancel	ок		Total 5 10/page 🗸 Pre	1 Next Go to	

Figure 78. Firmware upgrade function

8.1.5. Alarm settings

> Add alarm trigger type, for USR-G816, we add "Gateway monitoring trigger".

✻						🔿 service support 🛭 user rights 🚯 简体中文 🌀 1558883611:
		Alarm linkage > Gateway Monitoring Triggers				
		Gateway Monitoring Triggers				
			Add Trigger	×		2. Add Bulk Deletion
			3.			
		Trigger Name Belonging	* trigger name	Offine	Update time	Operation
			* Belonging	PUSR ~		
			organize			
			Alarm rule	The device is offline.		Total 0 10/page ~ Pre 1 Next Go to 1
			description	22 / 60		
			* Alarm Rules	Compared of the second		
	Gateway Monitoring			Gateway 10 minutes,lost 5 Times		
	Alarm settings			Wireless signal intensity of upper		
				wireless signal intensity 4 weak		
				Flow of current month > 1024 MB(1GB=1024MB)		
				Bettery level < 20 %(Products with built-in batteries)		
				Gateway power failure alarm (only some product models are supported, please r		
				and to the product monour of controls relations purpoints for detailey		
				Cancel 4.		

Figure 79. Add alarm trigger type

> Add alarm contacts and verify email.

*								🚯 简体中文 🛛 👼 15588836112
53		Alarm linkage > Alarm contacts						
Z		Contacts						
Ŷ			Add Contact		×		2.	Add Bulk Deletion
Ċ		Contact name Belo	3.			dd people	Update time	Operation
æ			* Contact name	Testusers	Associated User			
			* Please select	PUSR				
			organization			Total 0	10/page v Pre 1	Next Go to 1
_			Email	liuranee allere				
Ē								
		<	Email	Please Input Verification Code Get Code				
			Code					
			Remark	Please Input Remarks				
1.					4			
\otimes				Cancel	Save			
▣						ļ		
\$								
Ŀ								
	V6.0.0							





> Add alarm configuration

⋪	USR Cloud Conso	ble				⊖ servic	ce support 🏾 🜒 user rights	③ 简体中文 (前) 1558883611:
		Alarm linkage -> Alarm settings						
		Alarm settings						
		Please select orgar V All Types V Please Inpu	onfiguration	×				Add Bulk Deletion
		Alarm configuration name Belonging organize	Offlinetest		sm Status	Founder	Update time	Operation
		configuration nam						
		* Belongin	PUSR				_	_
		organiz				Total 0	10/page v Pre	Next Go to 1
		* Push typ	trigger \sim					
	Template triggers	<	Gateway detection trigger V					
	Gateway Monitoring	* Pushin	Value of the variable reaches the trigger condition					
		mechanisr	Pushing only first time					
			○ Alarm silence time minute ◎					
		1 Duck and to	The second se					·
		- Push neuro	Euron					
		* Pushe	Check All					
			Testusers(PUSR)					
				- 1				
	V6.0.0							

Figure 81. Add alarm configuration

> Check the alarm email: Power off the USR-G816



8.2. DDNS

Communication Expert of Indut	trial IOT	Be Hone	est, Do Best!
USR-G816	Dynamic DNS Dynamic DNS configuration	n allows access to a fixed domain for the host, but the corresponding IP may be dynamic.	
 ✓ Services USR Cloud 	Configuration		
DDNS Phtunnel > Network	Event interface	wan_5g v Network on which the ddns-updater scripts will be started	
> VPN > Firewall	Service Username	dyndns.org Service provider username	
> DTU > System > Logout	Password Domain Name		
	Sync Time	300. Unit: s, 30-65535	
		Apply Save	
			_
		JINan Usr IOF Technology Limited http://www.pusr.com/	<u>@</u>

Figure 82. Enable DDNS

9. AT Command

When the device works in transparent mode or HTTP mode, can switch to "AT command mode" by sending time-specific data by serial port. When the operation is completed in "AT command mode", send specific commands to return to the previous working mode.



Figure 83. Sequence chart

Time sequence of switching from transparent mode to "AT Command mode" :

1. Serial device continuously sends "+++" to the device. After receiving "+++", the device will send an "a" to

the serial device.



2. No data can be sent during a packaging cycle before sending "+++".

3. When the serial device receives "a", a "a" must be sent to the device within 3 seconds.

4. After receiving 'a', the device returns "+ok" and enter "temporary command mode" .

5. After receiving "+ok", the device has enter "temporary command mode" and now can send AT command to it.

6. Serial device sends command "AT+ENTM" to the PUSR device.

7. After receiving the command, the PUSR device sends "+OK" to the serial device and returns to the previous working mode.

8. When the serial device receives "+OK", it knows that the PUSR device has returned to the previous working mode.

9.1. Serial AT Commands

In transparent mode, we can directly send "Command Password+AT command" to query and configure the parameters without changing to command mode. The default password is test.cn#, the one in "7.1.4. Advanced settings (AT command password)". Users can modify it in the following page.

Communication Expert of In	Austrial IOT Be Honest, Do Best!
USR-G816	DTU Setup
> Status	DTU General Configurations
> Services	Configurations
> Network	Protocol Format Select Heartbeat Packet Registry Packet Advanced Setting
> VPN	Command Header test.cn#
✓ DTU	
General Settings	
Serial Port Settings	Apply Save
SOCKET	
HTTPD	
> System	
> Logout	
	JiNan Usr IOT Technology Limited http://www.pusr.com/

Figure 84. The default password

Send command to query parameters. Then send "test.cn#AT+WANN" from the serial port, we will receive the response from the module. (Please note there is a line feed after the command. User can also use "AT+CMDPW" to query or configure the command password.



· ·	Uart Assistant	₩ - □ ×
COM Configs	Data log	<u>UartAssist V5.0.2</u> 🗇 🗘
Baudrate 115200	[2023-09-01 11:35:18.746]# SEND ASCII>	^
Paritybits NONE 👤 Databits 8 👤	[2023-09-01 11:35:29.034]# SEND ASCII> test.cn#AT+LANN	
Stopbits 1	[2023-09-01 11:35:29.125]# RECV ASCII>	
· Close	+LANN:192.168.1.1,255.255.255.0	
Recy Options	[2023-03-01-11-35-39-317]# SEND ASCII/2 test.cn#AT+WANN	
ASCII C HEX	[2023-09-01 11:35:39.668]# RECV ASCII>	
✓ Log Display Mode	+WANN:DHCP,172.16.10.136,0.0.0	
Auto Linefeed		
Save Recv to File		
AutoScroll Clear		
Send Options		
ASCII O HEX		
Use Escape Chars i	<u></u>	× .
Auto Append Bytes	Data Send 1. DCD • 2. RXD • 3. TXD • 4. DTR • 5. GND •	6. DSR 🛛 두 Clear 🛧 Clear
Cucle 50000 ms	test.cn#AT+WANN	
Shortcut <u>History</u>		Send
🞯 Ready!	2/3 RX:71	TX:37 Reset

Figure 85. Serial AT command test

9.2. Network AT Command

In transparent mode, user can send "command password+AT command" to query and configure parameters. Network AT commands are used to query or configure the parameters from remote server, which is similar to serial AT commands. For example, we can send "www.usr.cn#AT+VER" to query the firmware version from server side (there is a line feed after the command).


USR-G816 User Manual

	Network Assistant	₩ - □ ×
Settings	Data log	NetAssist V5.0.2 🗇 🗘
TCP Server	[2023-09-01 11:47:02.631]# Client 192.168.1.1:38868 gets online.	^
(2) Local Host Addr 192.168.1.136	[2023-09-01 11:47:17.247]# SEND ASCII TO ALL> test.cn#AT+VER	
(3) Local Host Port	[2023-09-01 11:47:17.278]# RECV ASCII FROM 192.168.1.1 :38868>	
2317	+VER:V1.0.10.wifi-EN	
· Close		
Recv Options		
Log Display Mode		
Auto Linefeed		
Hide Received Data		
Save Hecv to File		
<u>AutoScroll</u> <u>Clear</u>		
Send Options		
⊙ ASCII ⊂ HEX		
🔲 Use Escape Chars (i)		\sim
Auto Append Bytes	Data Send Clients: All Connections (1)	🖵 Clear 🗍 Clear
Send from File	least an that U/EP	
Cycle 1000 ms	Itest. ChimAT +VEH	Send
<u>Shortcut</u> <u>History</u>		
🎯 Ready!	1/1 BX:24	TX:14 Reset

Figure 86. Network AT command test

10. Contact Us

Jinan USR IOT Technology Limited

Address : Floor 12 and 13, CEIBS Alumni Industrial Building, No. 3 Road of Maolingshan, Lixia District, Jinan, Shandong, China

Official website: https://www.pusr.com

Official shop: https://shop.usriot.com

Technical support: http://h.usriot.com/

Email : sales@usriot.com

Tel:+86-531-88826739

Fax: +86-531-88826739-808

11. Disclaimer

The information in this document provided in connection with Jinan USR IoT technology ltd. and/or its affiliates' products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of USR IoT products. EXCEPT AS SET FORTH IN THE TERMS AND CONDITIONS AS SPECIFIED IN THE LICENSE AGREEMENT FOR THIS PRODUCT, USR IOT AND/OR ITS AFFILIATES ASSUME NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING



USR-G816 User Manual

TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL USR IOT AND/OR ITS AFFILIATES BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF USR IOT AND/OR ITS AFFILIATES HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. USR IOT and/or its affiliates make no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. USR IoT and/or its affiliates do not make information commitment update the contained in this document. any to







Official Website: www.pusr.com Official Shop: shop.usriot.com Technical Support: h.usriot.com Inquiry Email: inquiry@usriot.com Skype & WhatsApp: +86 13405313834 Click to view more: Product Catalog & Facebook & Youtube

关注有人微信公众号 登录商城快速下单