

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 | |



| | 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 Maximum Transmission | 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 5G SA Sub-6: Max. 2.4Gbps (DL)/Max. 900Mbps (UL); |
| | 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- 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 KV RMS |
| | PWR | red, always on after powered on |
| | WORK | green, blinking every 1second 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 re 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°C ~ +75°C |
| | 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:

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 🗟 년 ☆ 🔲 😩 : |
| USR-G816 | | |
| Communication Expert of Industrial IOT | | Be Honest, Do Best! |
| | Authorization Required Please enter your username and password. | |
| | Username: root Password: •••• | |
| | Login Reset | |

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 etho 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-6816 | |
| > Firewall > DTU | | |
| ✓ 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 > DTU | Confirmation # |
| ✓ System | |
| System | Apply |
| 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 > Firewall | Periodic Reboot Weekly |
| > DTU | Week Days Sunday |
| ∨ System | Random Time Enable 🗸 |
| System Administration | Randomly generate the restart time (hours and minutes) to avoid the device online at the same time. If disabled, custom time is required. Andom Range(Start) 4:00 |
| Reboot Timer | |
| NTP | |
| Http Port | Reboot Time 4:25 |
| Syslog | |
| Backup/Upgrade Reboot | Apply Save |
| > Logout | |
| | |
| | |
| | |
| | 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.



| Communication Expert of Industr | | nest, Do Best! AUTO REFRESH ON |
|---------------------------------|---|-----------------------------------|
| USR-G816 | NTP The Time Synchronization section is used to configure general router time settings, like selecting the local time zone, synchronizing the time and NTP. | |
| > Status | The Time Synchronization section is used to configure general router time settings, like selecting the focal time zone, synchronizing the time and MTP. | |
| > Services | Time Parameter | |
| > Network > VPN | Current System Time 2023-07-27 17:46:55 Thu 😰 Sync with browser | |
| > Firewall | Time Zone Asia/Beijing 🗸 | |
| > DTU | | |
| ∽ System | Time Synchronization | |
| System | | |
| Administration | Enable NTP Client 🔀 | |
| Reboot Timer | NTP Server | |
| NTP Http Port Syslog | Alternate NTP Server ntp1.aliyun.com N time1.cloud.tencent.com N time.ustc.edu.cn N | |
| Backup/Upgrade | cn.pool.ntp.org | |
| Reboot | | |
| > Logout | Apply Save | |
| | 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 | 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 |
| > 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 Indus | nial lor 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 17:27:27 (none) kern.info kernel: [3183.702354] pci 0000:01:00.0: quirk_sprd_pci_resizebar: bar1 size 0x10000 Jul 27 17:27:27 (none) kern.info kernel: [3183.709194] pci 0000:01:00.0: quirk_sprd_pci_resizebar: bar2 size 0x20000 Jul 27 17:27:27 (none) kernel kernel: [3183.709194] pci 0000:01:00.0: quirk_sprd_pci_resizebar: bar2 size 0x20000 |
| Reboot Timer | Jul 27 17:27:27 (none) kern.info kernel: [3183.715885] pci 0000:11:00.0: quirk_sprd_pci_resizebar: bar3 size 0x:10000 Jul 27 17:27:27 (none) kern.info kernel: [3183.722808] pci 0000:01:00.0: quirk_sprd_pci_resizebar: bar4 size 0x:20000 Jul 27 17:27:27 (none) kern.info kernel: [3183.725875] pci 0000:01:00.0: quirk_sprd_pci_resizebar: bar5 size 0x:10000 |
| NTP | Jul 27 17:27:27 (none) kern.info kernel: [3183.733043] get_pd_host_memory : smem-info:0x88000000,0x88000000,0x300000 Jul 27 17:27:27 (none) kern.info kernel: [3183.743095] get_pd_host_memory : smem-info:0x88000000,0x8000000 Jul 27 17:27:27 (none) kern.info kernel: [3183.743095] get_pd_host_memory : smem-info:0x88000003 |
| Http Port | Jul 27 17:27:27 (none) kern.info kernel: [3183.750977] pci 0000:01:00.0: quirk_sprd_pci_resizebar: 00 MSL_NEW 0x1df86502,0x88000003 Jul 27 17:27:27 (none) kern.info kernel: [3183.855664] pci 0000:01:00.0: quirk_sprd_pci_resizebar: MSL_LAST:0x1df80000,0x88000003,Joop=0 Jul 27 17:27:27 (none) kern.info kernel: [3183.090220] PCI: busi: Fast back to back transfers disabled |
| Syslog | Jul 27 17-27:27 (none) kern-lin 5 kernel: 1383-916277) pcl 0000-00:00.0. BAB 8: assigned [mem 0x48000000-0x48ffffff] Jul 27 17-27:27 (none) kern-lin 6 kernel: 1383-92665 pcl 0000-00:00.0: BAB 0: assigned [mem 0x49000000-0x49fffff] |
| Backup/Upgrade | Jul 27 17:27:27 (none) kern.info kernel: [3183.929567] pci 0000-11:0:0:0: BAR 0: assigned [mem 0x4800000-0x487ffff pref] Jul 27 17:27:27 (none) kern.info kernel: [3183.937339] pci 0000:11:0:0: BAR 2: assigned [mem 0x4800000-0x489ffff pref] |
| Reboot | Jul 27 17:27:27 (none) kern.info kernel: [3183.943375] pic 0000:01:10:0: BBA 4: assigned [mem 0x48a00000-0x48Dffff] Jul 27 17:27:27: (none) kern.info kernel: [3183.951313] pic 0000:01:00: BBA 1: assigned [mem 0x48a00000-0x48Dfff] |
| > Logout | Jul 27 17:27:27 (none) kern.info kernel: [3183.958247] pcl 0000-111:0:0:1: BAB 3: assigned [mem 0x48c10000-0x48c1fff] Jul 27 17:27:27 (none) kern.info kernel: [3183.971038] pcl 0000-101:0:0: BAB 3: assigned [mem 0x48c20000-0x48c2fff] Jul 27 17:27:27 (none) kern.info kernel: [3183.971038] pcl 0000-001:0:0: BaB 5: assigned [mem 0x48c20000-0x48c2fff] Jul 27 17:27:27 (none) kern.info kernel: [3183.981479] sprd-pcle-ep-device 0000:11:0:0: ep: probe Jul 27 17:27:27 (none) kern.info kernel: [3183.981479] sprd-pcle-ep-device 0000:11:0:0: enabling device (0144 -> 0142) Jul 27 17:27:27 (none) kern.info kernel: [3183.99038] pcl 0000:00:0:0:0: enabling device (0144 -> 0142) Jul 27 17:27:27 (none) kern.info kernel: [3183.99038] pcl 0000:00:0:0: enabling device (0144 -> 0142) Jul 27 17:27:27 (none) kern.info kernel: [3183.99038] pcl 0000:00:0:0: enabling device (0144 -> 0142) Jul 27 17:27:27 (none) kern.info kernel: [3184.00756] sprd-pcle-ep-device 0000:1:0:0: e; sb&R[1] [mem 0x48c00000-0x48cffff] Jul 27 17:27:27 (none) kern.info kernel: [3184.00756] sprd-pcle-ep-device 0000:1:0:0: e; sb&R[1] [mem 0x48c00000-0x48cffff] Jul 27 17:27:27 (none) kern.info kernel: [3184.00756] sprd-pcle-ep-device 0000:1:0:0: 0; e; B&R[2] [mem 0x48c00000-0x48cffff] Jul 27 17:27:27 (none) kern.info kernel: [3184.01350] sprd-pcle-ep-device 0000:0:1:0:0: e; sb&R[2] [mem 0x48c00000-0x48cffff] Jul 27 17:27:27 (none) kern.info kernel: [3184.01350] sprd-pcle-ep-device 0000:0:1:0:0: e; sb&R[2] [mem 0x48c00000-0x48cffff] Jul 27 17:27:27 (none) kern.info kernel: [3184.01350] sprd-pcle-ep-device 0000:0:1:0:0: e; sb&R[2] [mem 0x48c00000-0x48cffff] Jul 27 17:27:27 (none) kern.info kernel: [3184.01350] sprd-pcle-ep-device 0000:0:1:0:0: e; sb&R[2] [mem 0x48c00000-0x48cffff] Jul 27 17:27:27 (none) kern.info kernel: [3184.01350] sprd-pcle-ep-device 0000:0:1:0:0: e; sb&R[2] [mem 0x48c10000-0x48cffff] |
| | JiNan Usr IOT 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 | dustrial IOT Be Honest, Do Best! |
|---|--|
| USR-G816 Status Services Network VPN Firewall DTU System Administration Reboot Timer NTP Http Port Syslog Backup/Upgrade Reboot Cogout | System Log Conclusion Configuration Total Configuration Total Configuration Configuration Total Configuration Total Configuration Total Configuration Configuration Total Configuration Total Configuration Total Configuration Total Configuration Configuration Total Configuration </th |
| | 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.



| Backup / Flash Firmware Click "Generate archive" Click "Generate archive" Download backup: Berowse Divide Flash new firmware Backup / Flash Firmware Backup / Flash Firmware Backup / Flash Firmware Click "Generate archive" Berowse Prove Backup / Flash Firmware Backup / Flash Firmware Backup / Flash Firmware Backup / Flash Firmware Backup / Flash new firmware Backup / | Backup / Flash Firmware Autus Noices etwork No ewall U Composed backup: @ Cenerate archive' to download a tar archive of the current configuration files. To reset the firmware to its initial state, click 'Perform reset'. Download backup: @ Cenerate archive' wwall U To restore configuration files, you can upload a previously generated backup archive here. Rester to defaults: @ Perform To restore configuration files, you can upload a previously generated backup archive here. Rester to backup: Poses select file @ Port step port step port step port step port step port step step port step port step step port step step step step step step port step step <th>USR IOT Communication Expert of Industrial IOT</th> <th>Be Hone</th> | USR IOT Communication Expert of Industrial IOT | Be Hone |
|--|---|---|--|
| Services Click 'Generate archive' to download a tar archive of the current configuration files. To reset the firmware to its initial state, click 'Perform reset'. Network Download backup: @ Generate archive VPN Reset to defaults: @ Perform DTU To restore configuration files, you can upload a previously generated backup archive here. System Restore backup: @ Generate archive @ Browse @ Upload archive Administration Flash new firmware image NTP 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. Http Port System Syslog Image: @ Generate if @ Browse @ Flash image Backup/Upgrade Reset to generate fire @ Browse @ Flash image | Backup / Restore Services Citk "Generate archive" to dominad at ar archive of the current configuration files. To reset the firmware to its initial state, click "Perform reset". Network Download backup: @Generate archive VPN Reset to defaults: @Perform Firewall To restore configuration files, you can upload a previously generated backup archive here. System Restore backup: @Generate interes @ Browse @ Upload archive System Restore backup: @Generate interes @ Browse @ Upload archive Administration Restore backup: @Generate intege NTP 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. Systog Image: @Reade select file @ Browse @ Flash image Backup/Upgrade Restore file @ Browse @ Flash image | USR-G816 | Backup / Flash Firmware |
| DTU To restore configuration files, you can upload a previously generated backup archive here. System Administration Reboot Timer NTP 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. Http Port Systeg Backup/Upgrade Reboot | DTU To restore configuration files, you can upload a previously generated backup archive here. System Administration Reboot Timer NTP 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. Http Port Systog Backup/Upgrade Reboot | Services Network VPN | 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: |
| Reboot Timer Flash new firmware image NTP 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. Http Port Keep settings: Syslog Image: Backup/Upgrade Image: | Reboot Timer Flash new firmware image NTP 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. Http Port Keep settings: Syslog Force Upgrade Backup/Upgrade Image: Please select file Brows Reboot | > DTU > System System | |
| Syslog Force Upgrade: Backup/Upgrade Image: Please select file Image: Reboot Flash image | Syslog Force Upgrade Image: Please select file Browse Flash image Reboot | Reboot Timer NTP | 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. |
| > Logout | | Syslog Backup/Upgrade | |
| | | | |

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 System Administration Reboot Timer NTP Http Port Syslog Backup/Upgrade Reboot Cugout | 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 Industria | нот | | | Be Honest, Do Best! |
|--|---------------------------------------|--|----------------------|---------------------|
| USR-G816 | WAN | | | |
| > Status | WAN Overview | | | |
| > Services | Network | Status | Actions | |
| Vetwork | <mark>WAN_5G</mark> ایتار pcie0 | 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_WIRED | Uptime: 1h 18m 57s MAC-Address: D4:AD:20:5E:61:71 RX: 98:46 MB (275:406 Pkts.) TX: 14:18 MB (27774 Pkts.) 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 ⊢ | Ionest, 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.; ethe. 1). | |
| Services Network | Common Configuration | |
| WAN | General Setup | |
| LAN Cellular Network | Status Uptime: 1h 19m 35s Image: MAC-Address: D4AD/20.5E61:71 | |
| Network Switch | eth0 RX: 100.111 MB (278076 Pkts.) TX: 14.32 MB (72594 Pkts.) IV: 14.32 MB (72594 Pkts.) IV: 172.161.134/23 | |
| Wireless | | |
| DHCP | Protocol DHCP client | |
| Static Routes | Hostname to send when USR-G816 requesting DHCP | |
| WAN/LAN Port Diagnostics | | |
| > VPN | Back to Overview Apply Save | |
| > Firewall | | |
| > DTU | | |
| > 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 | | est, Do Best! |
|---|--|---------------|
| USR-G816 | WAN - WAN_WIRED | |
| StatusServices | 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 ($\underline{e_{Q_i}}$ +tb0.1). | |
| ✓ Network | Common Configuration | |
| WAN | General Setup | |
| LAN | Status Uptime: 0h 27m 26s | |
| Cellular Network | MAC-Address: D4:AD:20:67:F0:15 RX: 7.15 MB (67736 Pits.) | |
| Network Switch | etnu TX: 22.39 KB (239 Pkts.) IPv4: 172.16.10.136/23 | |
| Wireless | | |
| WWAN | Protocol Static address | |
| DHCP Static Routes | IPv4 address | |
| WAN/LAN Port | IPv4 netmask Please choose | |
| Diagnostics | IPv4 gateway | |
| > VPN | | |
| > Firewall | IPv4 broadcast | |
| > DTU | Use custom DNS servers | |
| > System | | |
| > 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.



| USR IOT Communication Expert of Indus | | est, Do Best! |
|--|--|---------------|
| USR-G816 Status Services V Network | 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.: eta0. 1). Common Configuration | |
| WAN | General Setup Advanced Settings | |
| Cellular Network Network Switch Wireless | Status Uptime: 0h 35m 46s Image: 0h 35m 46s MAC-Address: 04AD:20.67;FC:15 RK: 9.09 MB (65418 Pkts.) RK: 9.09 MB (65418 Pkts.) Image: 0h 35m 46s TX: 29.08 KB (331 Pkts.) Image: 0h 35m 46s Image: 0h 35m 46s | |
| WWAN DHCP Static Routes | Protocol PPPoE V PAP/CHAP username | |
| WAN/LAN Port Diagnostics > VPN | PAP/CHAP password | |
| > Firewall > DTU > System | | |
| > Logout | | |
| | JiNan Usr IOT Technology Limited http://www.pusr.com/ | 0 |

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 |
|--------------------------------|--|
| USR-G816 | General Setup |
| 03K-0010 | Status Uptime: 0h 52m 57s |
| > Status | MAC-Address: D4:AD: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 gateway |
| Wireless | IPv4 broadcast |
| WWAN | |
| 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 | () Lowest leased address as offset from the network address. |
| > Logout | Limit 150 |
| | Maximum number of leased addresses. |
| | Lessetime 12h |
| | JiNan Usr IOT Technology 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 |
|--|--|
| Settings for APN address, username and password, if you goning to use an APN card, please fill in the form correctly. Effective configuration search profition, can improve the network search time. | |
| | |
| > 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 Continu Dial Failures 2 | |
| DHCP Continu Dial Failures 2 v (a) Signal value that triggers SIM card switchover(1-50) | |
| Static Routes Link Detection Enable SIM18.SIM2 | |
| WAN/LAN Port | |
| Diagnostics Detection Interval 10 @ The interval between the two pings, unit: sec (5-86400) | |
| > VPN Detection Fail Number 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/ | ${\color{black} \textcircled{\black}}$ |

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 | | 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 SIM1 Config SIM2 Config Module Info | I |
| ✓ Network WAN | APN Name AutoCheck APN Vame, 0-62 characters User Name | |
| 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 Image: | |
| DHCP Static Routes | Network Mode AUTO AUTO | |
| WAN/LAN Port Diagnostics | SA Enable 5G SA Enable 5G SA | |
| > VPN > Firewall | Network Search Priority GS>4G>3G Gonfiguration 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.

| | Effective configuration search priority, can improve the | network search time. | _ |
|-------------------------------|--|--|-------|
| USR-G816 | Be sure to fill in the correct configuration, otherwise 50 | will be unable to access the Internet. | |
| | Configuration | | |
| Status Services | 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 | Operator Information: | CHN-CT | |
| Static Routes WAN/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: | 8C3B485 | |
| System | | | |
| Logout | | | |

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 LAN | 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 | 8.8.8.8 |
| Static Routes WAN/LAN Port | Ping Interval | |
| Diagnostics > VPN | Package size | 100 |
| > Firewall | Timeout | 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: USR-G816-6171 BSSID: DA4D-20:5E61:73 |
| Cellular Network | | Channel: 1 (2.412 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 > VPN | | |
| > Firewall | HW Mode | 11ng • Ø 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 | | | | | | | | |
| > Firewall > DTU | | | | | | | | |
| > System | | | | | | | | |
| > System | | | | | | | | |
| 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 | Ве Hones иложе | |
|--|--|--|
| 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,



| USR IOT Communication Expert of Industria | Hot 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. |
| ✓ Network WAN | Basic Settings 5.8G Settings AP Information |
| LAN | Scan Scan |
| Cellular Network Network Switch | SSID WIFI-STA Encryption No Encryption |
| Wireless WWAN DHCP | network wwan0 When selecting the LAN interface, please modify or close the DHCP configuration of the LAN port and configure the LAN port address as the address within the upper routing subnet |
| Static Routes | Enable Ping Check 🗌 🕜 Once selected, check the wireless connect with ping |
| WAN/LAN Port Diagnostics | Apply Save |
| > VPN | |
| > Firewall | |
| > 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.



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 | | | | | | onest, Do Best! |
|------------------------------|---------------|---|-----------------------|----------------------------|--------------------------|--------------------------------------|-----------------|
| USR-G816 | WWAN S | - | | | | | |
| > Status | | ing the STA, make sure that the AP corre e will be synchronized to the same as the | | bled. After the STA is suc | cessfully connected, the | channel, bandwidth and mode of the A | ٢ |
| > Services | Basic Setting | gs 2.4G Settings 5.8G Settings | AP Information | | | | |
| WAN LAN | 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 Leasetime remaining Hostname IPv4-Address Leasetime remaining USR-FEUWTMNMYOU 192.168.1.182 c89.402.7f.ea.53 11h 49m 10s USR-FEUWTMNMYOU 192.168.1.115 c85.scct.af.68.4b 10h 20m 32s |
| Wireless WWAN DHCP Static Routes | Static Leases Hostname MAC_Address IPv4-Address This section contains no values yet |
| WAN/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 Industr | ынот Ве Нол мито |
|---|---|
| USR-G816 | Static Routing To find information on static routing configuration, refer to the figure and table below |
| Status Services Network | Static Routing Routing Table |
| WAN | Static IPv4 Routes Interface Target <u>IPv4</u> -Netmask <u>IPv4</u> -Gateway Metric |
| Cellular Network Network Switch | This section contains no values yet |
| Wireless WWAN | New Rule: Interface Target IPX4-Netmask IPX4-Gateway Metric |
| DHCP Static Routes WAN/LAN Port | Host-IP or Network If target is a network |
| Diagnostics | |
| > Firewall > DTU | Apply Save |
| > System > Logout | |
| | |
| | JiNan Usr IOT Technology Limited http://www.pusr.com/ |

Figure 30. Static routing rule

| Items | 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.



| tion Expert of Industrial IOT | | | | | | | | |
|-------------------------------|--------------------|------------------------------|-------------------------------|-------|--------|-----|-----|-----------|
| Sta | tic Routing | | | | | | | |
| | | routing configuration, refer | to the figure and table below | | | | | |
| | | | | | | | | |
| Stat | ic Routing Routing | Table | | | | | | |
| Destir | nation | Gateway | Netmask | Flags | Metric | Ref | Use | Interface |
| 0.0.0 | | 172.16.10.1 | 0.0.0.0 | UG | 0 | 0 | 0 | eth0 |
| 0.0.0.0 | | 172.16.10.1 | 0.0.0.0 | UG | 5 | 0 | 0 | eth0 |
| 0.0.0.0 | | 10.0.0.1 | 0.0.0.0 | UG | 10 | 0 | 0 | pcie0 |
| 10.0.0 | .0 | 0.0.0.0 | 255.0.0.0 | U | 10 | 0 | 0 | pcie0 |
| 10.0.0 | .1 | 0.0.0.0 | 255.255.255.255 | UH | 10 | 0 | 0 | pcie0 |
| 172.16 | 5.10.0 | 0.0.0.0 | 255.255.254.0 | U | 5 | 0 | 0 | eth0 |
| 172.16 | 5.10.1 | 0.0.0.0 | 255.255.255.255 | UH | 5 | 0 | 0 | eth0 |
| 192.16 | 58.1.0 | 0.0.0.0 | 255.255.255.0 | U | 0 | 0 | 0 | br-lan |
| | | | | | | | | |
| | | | Apply Save | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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 (114.114.114.1 | Traceroute 14): 56 data bytes | Nslookup | |
| LAN Cellular Network Network Switch | 64 bytes from 114.114.114.114: seq=0 64 bytes from 114.114.114.114: seq=1 64 bytes from 114.114.114.114: seq=2 64 bytes from 114.114.114.114: seq=2 | ttl=69 time=6.051 ms ttl=79 time=5.913 ms ttl=81 time=6.005 ms ttl=83 time=6.303 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/avg/max = 5.913/6.108 | ed, 0% packet loss | | |
| DHCP Static Routes | | | | |
| WAN/LAN Port Diagnostics VPN | | | | |
| > VPN > Firewall > DTU | | | | |
| > System > Logout | | | | |
| | | | | |
| | JiNan U | Isr IOT Technology Limited http://www.pus | sr.com/ | |

Figure 33. Network diagnostics

| Table 9. Description of diagnostic types |
|--|
|--|

| 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 Oisable |
| > Network | Server Address | 192.168.0.2 |
| ✓ VPN | Interface | auto 🗸 |
| 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 | 255.255.2 |
| > Logout | | Q eg: 255.255.255.0, if empty, the default value is 255.255.255.0 |
| | NAT | |
| | Enable MPPE Encryption | |
| | MTU | 1450 |
| | | 60~1450 |
| | Extra option | |
| | | Append pppd options Non - professional careful modification |
| | | |
| | Enable Static Tunnel IP Address | |
| | | · · · · · · · · · · · · · · · · · · · |
| | | JiNan Usr IOT Technology Limited http://www.pusr.com/ |

Figure 34. PPTP VPN settings

| Items | 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.

| Communication Expert of Ind | ustrial IOT | Be Honest, Do Best! |
|---|-------------------------------|---|
| USR-G816 | L2TP Setting | |
| > Status | L2TP Parameters | Enable O Disable |
| Services Network | LZTP Client Server Address | © Enable O Disable |
| ✓ VPN | Interface | auto Auto refers used default route interface to connect |
| PPTP L2TP | User Name | |
| VPN Status | Password | <i>a</i> : |
| > Firewall > DTU | Tunnel Name | |
| > System | Tunnel Password | 2 Character(0-50) |
| > Logout | Remote Subnet | 192.168.55.0 @ eg: 192.168.10.0 |
| | Remote Subnet Mask | 255.255.0 @ eg: 255.255.0 |
| | 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 |
|--|---|---------------|
| erver Address Set L2TP server IP or domain name. | | 192.168.0.2 |
| Interface | Select the interface according to different networking methods. | |
| 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.


| Communication Expert of Industrial IOT | | | | | | Be Honest, D | |
|--|----------------------|--------------------------|---------------------------|--------|--------------|--------------|--|
| USR-G816 | OpenVPN Configur | ation | | | | | |
| Status | Enhanced OpenVPN des | ign allows 3 OpenVPN Cli | ents and 1 OpenVPN Server | r | | | |
| Services | OpenVPN Configura | ation | | | | | |
| Vetwork | Name | Туре | Description | Enable | Status | | |
| /PN | CLIENT_1 | CLIENT | | OFF v | Disconnected | Edit | |
| 2TP | CLIENT_2 | CLIENT | | OFF 🗸 | Disconnected | Z Edit | |
| DpenVPN Certificate Management | CLIENT_3 | CLIENT | | OFF 🗸 | Disconnected | Z Edit | |
| /PN Status | SERVER_1 | SERVER | | OFF 🗸 | Disconnected | Z Edit | |
| rirewall DTU System ogout | | | | Αρρίγ | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

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 | strial 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 > Logout | Interface | auto Auto refers used default route interface to connect |
| Logoat | Log Level | warning(3) Cog Level:0-11 |
| | Extra Option | The content here will be written directly to the configuration file. Please fill in carefully |
| | | W HIE CONSERS REFE WILL DE WILLER WIECUNG VO DIE CONTIGUIZATION THE, PRESSE THI IN CARENNY |
| | Local Route - LAN IP a | ddress and subnet mask of the remote network. |
| | | Subast Nativask Nativask 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 | Port | 1194 | |
| OpenVPN | | | |
| Certificate Management | Authentication Type | SSL/TLS V | |
| VPN Status | TUN/TAP | TUN 🗸 | |
| > Firewall | Topology | 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 (2) 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-G816 • Status • Status • Status • Oral • Oral | USR IOT Communication Expert of Indu | Austrial IOT | , Do Best! |
|--|--|--|------------|
| pkcs12(,p12) 透理文件 未造择任何文件 ④ PKCSH2 (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 & | Status Services Network VPN PPTP L2TP OpenVPN Certificate Management VPN Status Firewall DTU System | The current page is used to centrally manage various certificate and key files related to OpenVPN | |
| ca 基礎文件 未选择任何文件 - | | pkcs12(.p12) 進程文件 ● PKCS#12 (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. | · |

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 | | ② The maximum length is 50 Bytes. | |
| РРТР | Enable OpenVPN Config from file | ig Not Support | |
| L2TP | | | |
| OpenVPN | Protocol | | |
| Certificate Management | Port | rt 1194 | |
| VPN Status | Authentication Type | e SSL/TLS V | |
| > Firewall | TUN/TAP | p TUN 🗸 | |
| > DTU | Τοροίοαγ | y Subnet V | |
| > System | | | |
| > Logout | Client Subnet | at | |
| | Client Netmask | ik | |
| | Renegotiation Interval(s) | s) 3600 | |
| | max clients | 16 | |
| | | 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 Input Output Forward Masquerading MSS Ian: Image: | S 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 |
|-----------------------|--|---|---|
| | | ter or service within the private LAN. | |
| Port Forwards Name | Match Rules | Forwarding To | Enable Sort |
| | This section contain | ns no values yet | |
| Name | Protocol External External port zone | Internal Internal IP Internal port zone address | |
| New port forward | | | Add 📋 |
| | | _ | |
| | | | |
| | liNan Hsr IOT Technology Limited http://www | w nuss com/ | |
| | Port forwarding allows remote Port Forwards Name New Port Forwarding Rules: Name New port forward | Port Forwards Name Match Rules This section contain New Port Forwarding Rules: Name Protocol External External port Zone New port forward TCP+UDP v wan v | Port forwarding allows remote computers on the internet to connect to a specific computer or service within the private LAN. Port Forwarding Name Protocol External port Internal Internal IP Internal Protocol External port Internal IP Internal IP |

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 opt 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. | Disable |
| 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 | Choose the protocol of the traffic rules, including TCP+UDP, TCP, UDP, ICMP | TCP+UDP |
| 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 | details 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 Ind | strial IOT |
|---|--|
| 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 Sort |
| VPN Firewall General Settings Port Forwards | Allow- Ping From any host in wan Accept input I et al. Input I e |
| Traffic Rules Access Restrictions > DTU | Open ports on router: Name Protocol External port New input rule TCP+UDP TCP+UDP |
| > System > Logout | New forward rule: Destination zone Name Source zone New forward rule Ian Vew forward rule Ian |
| | 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.

| ltems | 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 |
|--|-----------------------|---|----------------|--------|-----------------|
| R-G816 | Allow- Ping | From any host in way From any host in way 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 |
| s | - | Any TCP,UDP From any host in lan To any host in wan | Accept forward | •• • | Edit Delete |
| ces ork | - | Any tcp, udp From any host in wan To any router IP on this device | Accept input | •• | Edit 🗶 Delete |
| all | | Any TCP,UDP From any host in lan To any host in wan | Accept forward | •• | Edit 🗶 Delete |
| eral Settings | Open ports on router: | | | | |
| orwards | Name | Protocol External port | | | |
| : Rules is Restrictions | New input rule | TCP+UDP 🗸 | | | |
| _ | New forward rule: | | | | |
| m | Name | Source zone Destination zone | | | |
| at | New forward rule | Ian 🗸 wan 🗸 🖻 Add and edit | | | |
| | Source NAT | | | | |
| | Name | Protocol | | Action | Enable Sort |
| | | This section contains no vo | alues yet | | |
| | New course NAT: | | | | |
| | ANAL PROPER MAL | 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.

| 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 | | | | | Be Ho |
|--|-------------------|--|----------------|--------------|-------------|
| USR-G816 | Allow- Ping | From any notice performance 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 TCP,UDP 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 🗸 | | | |
| Access Restrictions | | | | | |
| > 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.

| ltems | Description | Default |
|----------------|---|---------|
| Name | The name of the rule, user defined. | 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 | |
| USR-G816 Open ports or | router: | |
| > Status | Protocol External port | |
| > Services New input rul | TCP+UDP 🗸 | |
| > Network | | |
| > VPN New forward a | 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 | | |
| | | |
| New SNAT ru | e lan v wan v Please chocv 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 | | operative of the traffic rule entry, such as matched source and destination hosts. |
| > Status | Enable | SNAT |
| > Services | Protocol | тср+идр м |
| > Network > VPN | Source zone | O lan: lan: 是变变 |
| ∨ Firewall | | wanz wan_wired: 2 wan_5g: 2 wan0: 2 |
| General Settings Port Forwards | Source IP address | any Only match incoming traffic from this IP or range. |
| Traffic Rules | Source port | any |
| Access Restrictions DTU | Destination zone | Match incoming traffic originating from the given source port or port range on the client host. Image: Incoming traffic originating from the given source port or port range on the client host. |
| > System | | O wan: wan_wired: ⊉ wan_5g: ﷺ wwan0: ֎ |
| > Logout | Destination IP address | Destination ip or ip range. |
| | Destination port | any @ Destination port or port range. |
| | SNAT IP address | 172.16.10.136 (etho) → @ Rewite matched traffic to the given address. |
| | SNAT port | Rewrite matched traffic to the given address. B899 Rewrite matched traffic to the given source port. May be left empty to only rewrite the IP address. |
| | | |
| | it | 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 whitelist | site for the first time due to browser reasons. |
| Services Network | Configurations | | |
| > VPN ~ Firewall | Method close 🗸 | | |
| General Settings Port Forwards | Name | Domain Name | Enable |
| Traffic Rules | | Somen Name | Liable |
| Access Restrictions DTU | | This section contains no values yet | |
| > System | New Firewall Rule: | | |
| > Logout | Name | Domain Name | |
| | New rule | | 📩 Add |
| | | | |
| | | Apply 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 | Access Restrictions 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 reason. Configurations Method Black List Method Black List Method Consain Name Enable blacklist www.baidu.com Enable blacklist www.baidu.com Enable blacklist www.google.com Enable | |
| | 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 | Method White List | ~ | | |
| General Settings Port Forwards | Name | Domain Name | Enable | |
| Traffic Rules Access Restrictions | blacklist | www.baidu.com | | 🗷 Delete |
| > DTU > System | New Firewall Rule: | | | |
| > Logout | Name | | Domain Name | |
| | New rule | | | Add Add |
| | | Apply | Save | |
| | | | | |
| | | echnology Limited http://www.p | | |

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 NET V | |
| > Firewall > DTU | Restarting Without Data OFF | |
| General Settings | | |
| Serial Port Settings | | |
| SOCKET | Apply Save | |
| HTTPD | | |
| > System > Logout | | |
| Logout | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | JiNan Usr 10T 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 > VPN | 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 Concernal Settings Serial Port Settings SoCKET HTTPD System Logout | DTU Setup DTU General Configurations Configurations Protocol formal Select Heartbeat Packet OFF Type User-Defined Packet 0123450789 Image: Interpret Interp | |
| | JiNan Usr IOT Technology Limited http://www.pusr.com/ | |

Figure 55. Settings of registration packet

| Items | Description | Default | | | |
|--|--|------------------|--|--|--|
| Enable | Master switch of registration packet function. | OFF | | | |
| | 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. | | | | |
| | USR-Cloud: The registration package content is device ID assigned by | | | | |
| | 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 In | lustrial IOT | est, Do Best! |
|---|--|---------------|
| USR-G816 Status Services Network VPN Firewall Control Settings Serial Port Settings SOCKET HTTPD System Logout | DTU Setup DTU General Configurations Configurations Protocol Format Select Heartbeat Packet Registry 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 | ustrial 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 ~ | | |
| General Settings Serial Port Settings | Pairty | NONE | | |
| SOCKET | Packaging Interval | 10 ~ (a) 10-60000 milliseconds | | |
| HTTPD | Packaging Length | 1000 ~ | | |
| > System > Logout | | § 5-1500 Bytes | | |
| | | | | |
| | | | 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 Serial Port Settings SocKET HTTPD | Socket Settings Socket Basic Settings Configuration SocketA Parameters SocketB Parameters SocketC Parameters SocketD Parameters SocketA Parameters SocketA Disable • • SocketA • • • Operating Mode TCPC • • • 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 | description 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 | HTTPD Settings HTTPD Basic Settings Configuration Request Method Remove Header HTTP URL Server Address Remote Port Timeout | 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 | | Sock | etA 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,

| 🖞 Modbus Poll - Mbpoll1 | - 🗆 × |
|---|---|
| File Edit Connection Setup Functions Display Minuter Minuter | × |
| Connection Setup Connection Setup Connection Setup Connection Tx = 0: ID = 1: F = 03: SR = 10 No connection Alias 00000 Alias 00000 Alias 00000 Berial Settings Connection Serial Settings Connection Modbus TCP/IP Serial Settings Connection Modbus Setup Paddress or Node Name 192.168.1.1 Server Port Connect Timeout 502 3000 [ms] | 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 | | | |
| Image: Second system Image: Second system | Connection OK Serial Port Cancel Serial Settings USB-SERIAL CH340 (COM15) I15200 Baud ORTU ASCI B Data bits Flow Control B Data bits Flow Control DSR CTS RTS Toggle I Stop Bit It | | | |
| For Help, press F1. | | Port 4: 115200-8- | N-1 | |

Figure 65. Modify settings of Poll

5> Test result.

| Alias 00000 Tx = 17: Err = 0: ID = 1: F = 03: SR = 1000ms 0 Temp 35 1 Humidity 46 2 0 3 0 4 0 5 0 6 0 | | Edit Conner | tion Satur Display | File Falls Connection Factor Factor | Diselar Mary Mr. 1 |
|---|-------|-------------|--------------------|-------------------------------------|--------------------|
| D = 1: F = 03 Alias 00000 0 Temp 35 1 Humidity 46 2 0 0 3 0 0 4 0 0 5 0 0 6 0 0 1 Humidity 5 0 1 0 0 4 0 0 5 0 0 6 0 0 1 | | | | | |
| Alias 00000 0 Temp 3 00 4 0 5 0 6 0 | | | _ 🏯 🗏 🕴 🤻 | | |
| Alias O0000 0 Temp 35 1 Humidity 46 2 0 35 3 0000 35 4 00 3 5 00 4 00 5 00 | D = 1 | : F = 03 | | Depoll1 | |
| Humidity 46 Alias 00000 1 Humidity 46 35 2 0 1 46 3 00 2 0 4 00 3 0 5 00 4 0 6 00 5 0 | | Alias | 00000 | Tx = 17: Err = 0: ID = 1: F = 0 | 3: SR = 1000ms |
| 1 Humidity 46 35 2 0 1 46 3 0 2 0 4 0 3 0 5 0 4 0 6 0 5 0 | 0 | Temp | 35 | Alias 000 | 00 |
| 1 46 2 0 3 0 4 0 5 0 6 0 5 0 5 0 | 1 | Humidity | 46 | | |
| 4 0 5 0 6 0 5 0 5 0 5 0 5 0 | 2 | | 0 | | 46 |
| 3 0 5 0 6 0 5 0 5 0 | 3 | | 0 | 2 | 0 |
| 6 0 5 0 | 4 | | 0 | 3 | 0 |
| 5 0 | 5 | | 0 | 4 | 0 |
| | 6 | | 0 | 5 | 0 |
| | 7 | | 0 | - | |
| 8 0 | 8 | | 0 | | |
| 9 0 | 9 | | 0 | | |

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,

| / | Network | | | | | |
|---|----------------------|------------------------|-------------------|------------------------------|--------------------|--|
| | VPN | SocketA Parameters | ocketB Parameters | SocketC Parameters | SocketD Parameters | |
| | VEIN | | | | | |
| | Firewall | SocketA | Enable | ~ | | |
| ~ | DTU | | SocketA | | | |
| | General Settings | Operating Mode | TCPC | ~ | | |
| | 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 | | Need enable DTU | 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 | ss than 12 hours and less than 40 statistics cycles of traffice |
| > DTU | | a shar na noora shina naa sharana ayaala oo suunca |
| > System | Net Status record interval 5 | ss than 12 hours |
| > Logout | Net Status report interval 20 | |
| | | 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.



| Å | USR Cloud Conso | ble | | | | | | | | | O service support ♥ user right | ts 🚯 简体中文 👵 15588836112 | | |
|--------|-------------------------------|---------|-----------------------|-----------------------|----------------------|---------------|---|--------------|----------------------|--------------------|------------------------------------|-------------------------|--|--|
| 8 | Quick start | Gateway | management > Gate | away list | | | | | | | | | | |
| 2 | Screen management | Gatewa | ıy list | | | | Total Gateways • Online gateway • Offline gateway 6 0 6 | | | | | | | |
| Ŷ | | Please | e enter SN or ga | Query Advanced Search | 1 | | | | | | Add Delete Transfer gateway More | | | |
| e E | Device management/ Gateway | | Gateway status | Gateway name | SN | Gateway model | parameter loc | Number of as | Firmware Version | Belonging organize | Single Add | Operation | | |
| | Gateway list | | Succession of Statuto | outonay namo | on a | Suchay motor | k | ces | | Doronging organizo | Batch Add | | | |
| | 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.wifi-EN | PUSR | 美莲广场, Jinan Shi, Shandong 2501 | View Edit Delete More | | |
| 2 | Configuration management | | | 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 | | |
| щ | Data center 🛛 🗸 | | | Unnamed_Gateway na | 00005450000000000001 | 未知型号 | - | 0 | - | PUSR | 山东省济南市历下区坤顺路 | View Edit Delete More | | |
| ۵ | 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 | 山东省济南市历下区坤顺路 | View Edit Delete More | | |
| 8 | 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 | | | | | | | | | | | | | |
| Ð | loT | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | V6.0.1 | | | | | | | | | | | | | |

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 Firmware upgrade | * 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 | | | | | |
| | Alarm linkage 🛛 🗡 | Tag 🐵 Add tags | | | | | |
| © () | Maintenance 🗸 | Network | | | | | |
| \$ | management Extend ~ | Data transparency | | | | | |
| Ŀ | IoT | | | | | | |
| | | Save | | | | | |
| | V6.0.1 | | | | | | |

Figure 72. Enter the information of USR-G816



| ☆ | USR Cloud Console | ; | | | | | | | | | O service support ♥ user rig | nts 🚯 简体中文 🍈 15588836112 | |
|--------|---|-----------|-----------------------|-----------------------|-----------------------|---------------|---|--------------------------------------|---------------------|--------------------|------------------------------------|--------------------------|--|
| 83 | Quick start | Gateway m | anagement 🗦 Gate | way list | | | | | | | | | |
| ē | Screen management/ | Gateway | list | | | | Total Gateways • Online gateway • Offline gateway 5 1 4 | | | | | | |
| Ŷ | Scene management/ | Please e | enter SN or ga | Query Advanced Search | 1 | | | | | | Add Delete Transfer gateway More | | |
| e e | Device management' Gateway management Gateway list | | Gateway status | Gateway name | SN | Gateway model | parameter loc k | Number of as sociated devi ces | Firmware Version | Belonging organize | Gateway address | Operation | |
| | 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 | |
| | Configuration management | | Waiting for the initi | Unnamed_Gateway na | 000054500000000000001 | 未知型号 | - | 0 | - | PUSR | 山东省济南市历下区坤顺路 | View Edit Delete More | |
| 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 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 | |
| 8 | Value-Added services | | | | | | | | | | Total 5 10/page V Pre | 1 Next Go to 1 | |
| ▣ | Maintenance ~ management | | | | | | | | | | | | |
| ♦ | Extend ~ | | | | | | | | | | | | |
| D | юТ 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: Firmware V1.0 10 wifi-EN | | | | | |
| | Batch configuration Firmware upgrade | Version: Parameter debugging | | | | | |
| 5 | Configuration management | +SN 01302323060800000979 | | | | | |
| <u></u> | Data center 🛛 🗠 Alarm linkage 🗠 | | | | | | |
| | 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 Bend | | | | 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.

| * | US | SR Cloud Console | ; | | | | | | | | | O service support ♥ user rig | nts 🚯 | 简体中文 👩 15588836112 | |
|--------|------------|---|------------------------------------|-----------------------|-----------------------|----------------------|---------------|--------------------|--------------------------------------|---------------------|-----------------------------|------------------------------------|---------|------------------------------------|--|
| 8 | Qu | uick start | Cateway management -> Gateway list | | | | | | | | | | | | |
| ē |] Sci | creen management | Gateway | / list | | | | Total Gatev 5 | vays • Onlir 1 | • Offline gateway 4 | gateway | | | | |
| Ŷ |) Sci | cene management* | Please | enter SN or ga | Query Advanced Search | 1 | | | | | Add Delete Transfer gateway | | | | |
| ୯ ତ |] Ga ma | evice management ateway anagement Gateway list | | Gateway status | Gateway name | 5N | Gateway model | parameter loc k | Number of as sociated devi ces | Firmware Version | Belonging organize | Gateway address | Operati | n | |
| | | 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 | 0000545000000000003 | 未知型号 | - | 0 | - | PUSR | 山东省济南市历下区坤顺路 | View | Disable | |
| | | onfiguration ~ | | 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 | Da | ata 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 | |
| ₽ | L Ala | arm linkage 🛛 🗸 | | Offline | USR-M100 | 02700123031600055984 | USR-M100 | - | 1 | V2.0.03.000000.0000 | 根组织 | Swatch Jinan Mixc, East Jingshi Ro | View | | |
| 0 |) Val | lue-Added servicès | | | | | | | | | | Total 5 10/page V Pre | 1 | Next Go to 1 | |
| |] | aintenance anagement | | | | | | | | | | | | | |
| \$ | Ext | tend 🗸 | | | | | | | | | | | | | |
| |) ют | τ ν6.0.0 | | | | | | | | | | | | | |





| USR-G816 | |
|--|---|
| 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 | 2023-08-14 19:34:48 0 | | | 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 | Coffline time of gateway> 5 minute | | |
| | Gateway Monitoring Triggers | | | Gateway 10 minutes,lost 5 Times | | |
| | Alarm settings | | | Wireless signal intensity < weak ~ | | |
| | | | | 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 efer to the product manual or consult relevant personnel for details) | | |
| | | | | 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 | | | |
| M | | | * Please select | PUSR | | | | |
| | | | organization | | | Total 0 | 10/page v Pre 1 | Next Go to 1 |
| | | | Email | liuranee allere | | | | |
| Ē | | | | | | | | |
| | | < | Email Verification | 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 | le | | | | | | ⊖ servi | ice support 🛛 🕅 user rights | S 简体中文 💿 1558883611 |
|-----------|---|--|-------------------------|--|---|------|--------|---------|-----------------------------|---------------------|
| 53 | Quick start | Alarm linkage > Alarm settings | | | | | | | | |
| 2 | Screen management/ | Alarm settings | | | | | | | | |
| Ŷ | Scene management∽ | Please select organ V All Types V Please Input | AddAlarm Con | figuration | × | | | | | Add Bulk Deletion |
| G | Device management/ | Alarm configuration name Belonging organize | * Alarm | Offlinetest | | iism | Status | Founder | Update time | Operation |
| æ | Gateway management | con | nfiguration name | | | | | | | |
| M | Configuration \checkmark management | | * Belonging organize | PUSR | | | | Total 0 | 10/page v Pre | Next Coto 1 |
| <u>11</u> | Data center 🛛 🗸 | | organize | | | | | rotal 0 | Torpage Pre | |
| ≞ | Alarm linkage 🛛 🔿 | | * Push type | trigger \checkmark | | | | | | |
| | Template triggers | | * Select trigger | Gateway detection trigger $\ \lor$ Offline $\ \times$ $\ \lor$ | | | | | | |
| | Independent trigger Gateway Monitoring | | * Pushing | Value of the variable reaches the trigger condition | | | | | | |
| | Triaaers | | mechanism | Pushing only first time | | | | | | |
| | Alarm settings | | | Alarm silence time minute | | | | | | |
| () | Value-Added services | | Push method | 🗹 Email | | | | | | |
| ▣ | Maintenance | | Durker | | | | | | | |
| | management Extend ^V | | * Pusher | Check All Testusers(PUSR) | | | | | | |
| | loT | | | | | | | | | |
| | 101 | | | | | | | | | |
| | | | | | | | | | | |
| | 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 | O Network on which the ddns-updater scripts will be started | |
| > VPN > Firewall | Service Username | Service provider | |
| > DTU > System > Logout | Password Domain Name | | |
| | Sync Time | 300. Unit: s, 30-65535 | |
| | | Apply Save | |
| | | | |
| | | | _ |
| | | JiNan Usr IOT 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 > Firewall | 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> 🗇 🗘 |
| Channel COM16 #L - Baudrate 115200 - | [2023-09-01 11:35:18.746]# SEND ASCII> AT+LANN | ^ |
| 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 | |
| Recv Options | [2023-03-01 11.35.33.317]# SEND ASCII> test.cn#AT+WANN | |
| ASCII C HEX | [2023-09-01 11:35:39.668]# RECV ASCI> | |
| Log Display Mode | +WANN:DHCP,172.16.10.136,0.0.0 | |
| Auto Linefeed | | |
| Hide Received Data | 8 | |
| Save Recv to File | | |
| <u>AutoScroll</u> <u>Clear</u> | | |
| Send Options | | |
| | | |
| 🔽 Use Escape Chars 🛈 | | × . |
| Auto Append Bytes | Data Send 1, DCD ♦ 2, RXD ♦ 3, TXD ♦ 4, DTR ♦ 5, GND ♦ | 6. DSR 🛛 두 Clear 🛧 Clear |
| Send from File | test.cn#AT+WANN | |
| Cycle 50000 ms <u>Shortcut 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).



| | Network Assistant | ₩ - □ × |
|--------------------------------------|--|----------------------|
| Settings | Data log | NetAssist V5.0.2 🗇 🗘 |
| (1) Protocol 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 | | |
| | | |
| <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 | test.cn#AT+VER | |
| Cycle 1000 ms | Itest. ChimAT +VEH | Send |
| <u>Shortcut</u> <u>Mistory</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



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