



USER MANUAL

BTS-RBN-5G-IRU-2-DC

Industrial 5G Router

Firmware v7.4.0710 · Revision October 2026 · BATS Wireless

1. Overview

The BATS Wireless BTS-RBN-5G-IRU-2-DC is a compact industrial 5G router: a 5G/LTE modem feeds a Gigabit Ethernet LAN and dual-band Wi-Fi, powered from 7–16 V DC. This manual covers installation, configuration and operation for firmware version v7.4.0710.

What it does

- Shares a 5G SA/NSA or 4G LTE cellular connection with wired and wireless devices (default mode).
- Keeps the link up unattended: hardware and software watchdogs, link health checks, and automatic modem reset or reboot on failure.
- Connects remote sites through VPN: IPsec, OpenVPN, WireGuard, L2TP, PPTP and GRE.
- Supports routing features for M2M use: firewall, port mapping, static, policy and dynamic routing (RIP, OSPF), VRRP failover, SNMP and DDNS.

Specifications

Item	Specification
Processor	MediaTek MT7621, dual-core (4 threads)
Memory	128 MB RAM
Cellular module	Quectel RM520N-GL, 5G SA/NSA and LTE
Cellular antennas	4 × SMA female (external antennas, 4×4 MIMO)
Wi-Fi	2.4 GHz 802.11b/g/n up to 300 Mbps; 5.8 GHz 802.11ac up to 867 Mbps; internal antenna
Ethernet	1 × 10/100/1000 Mbps
SIM	1 × Nano-SIM, not hot-pluggable
Power input	2-pin DC, 7–16 V; 12 V, 2 A supply recommended
Power draw	< 500 mA at 12 V, full load
Operating temperature	–30 °C to +70 °C (–22 °F to +158 °F)
Storage temperature	–45 °C to +85 °C (–49 °F to +185 °F)
Max clients	60 wireless, 100 wired (theoretical)
Firmware	v7.4.0710, build date code 2026-08-25
Supported browsers	Chrome 60+, Firefox 55+, Safari 5+, IE 9+

2. Hardware and installation

The router is supplied as a sealed enclosure with four external connections: four SMA antenna ports for the cellular radio, one Gigabit Ethernet port, a 2-pin DC power input, and a Nano-SIM slot. Wi-Fi uses a built-in antenna intended for short-range setup and local access.

Connections

Connection	Type	Purpose
Cellular antennas 1–4	SMA female	5G/LTE antennas (4×4 MIMO)
Ethernet	10/100/1000 Mbps	LAN connection to your computer, switch or equipment
Power	2-pin DC, 7–16 V	Power input; 12 V, 2 A supply recommended
SIM	Nano-SIM slot	Carrier SIM card; not hot-pluggable
Wi-Fi	Internal antenna	2.4 GHz and 5.8 GHz access near the unit

Safety

- **Observe power polarity.** Polarity is screen-printed on the enclosure next to the DC input. Reversing + and – can damage the router.
- **Stay within 7–16 V DC.** Higher or lower voltage can damage the router. Power draw is under 500 mA at 12 V.
- **Power off before inserting or removing the SIM.** The slot is not hot-pluggable.
- **Connect the cellular antennas before applying power.** Transmitting into an open port can damage the radio.

Antennas

The cellular radio uses all four SMA ports at once, so connect an antenna to every port.

- Use antennas rated for 5G and LTE (typically 600–6,000 MHz) with SMA male connectors.
- Space the antennas apart and point them in different orientations for the best MIMO performance.
- For remote-mounted antennas, use short, low-loss cable; every metre of cable reduces signal, especially on the 3.3–4.2 GHz 5G bands.

- Check signal quality on the **Interface** page after installation (section 4) and adjust placement until RSRP and SINR are in the good range.

The internal Wi-Fi antenna gives short range. Plan to configure the router from within a few metres, or use the Ethernet port.

Status indicators

The status LEDs are visible around the Ethernet port.

LED	Behavior	Meaning
SYS (blue)	Steady	Cellular data connection up
SYS (blue)	Fast flash	Dialing / connecting
SYS (blue)	Slow flash	Connection failed
Signal (green)	On	Good 5G/4G signal
Signal (red)	On	Poor 5G/4G signal
Both signal LEDs	Off	No signal, no SIM, or modem not detected

The LEDs can be switched off under **Indicator > LED Light** (section 8).

Installation

1. With power disconnected, insert a Nano-SIM into the SIM slot until it latches.
2. Connect four cellular antennas to the SMA ports.
3. Connect the Ethernet port to your computer, switch or equipment.
4. Connect a 7–16 V DC supply to the power input, matching the polarity printed on the enclosure.
5. Wait about 40 seconds for the router to boot. The SYS LED fast-flashes while dialing and goes steady once the cellular link is up. Then connect by Ethernet or Wi-Fi (section 3). The cellular link normally comes up within 1–2 minutes.

3. Getting started

Out of the box the router is a working 5G gateway: insert a SIM, power it up, and connect a computer by Ethernet or Wi-Fi to reach the web interface at **http://192.168.8.1** (user **admin**, password **admin**).

Connect a computer

By Ethernet: connect the computer to the Ethernet port. It receives an address from 192.168.8.2–192.168.8.250 automatically.

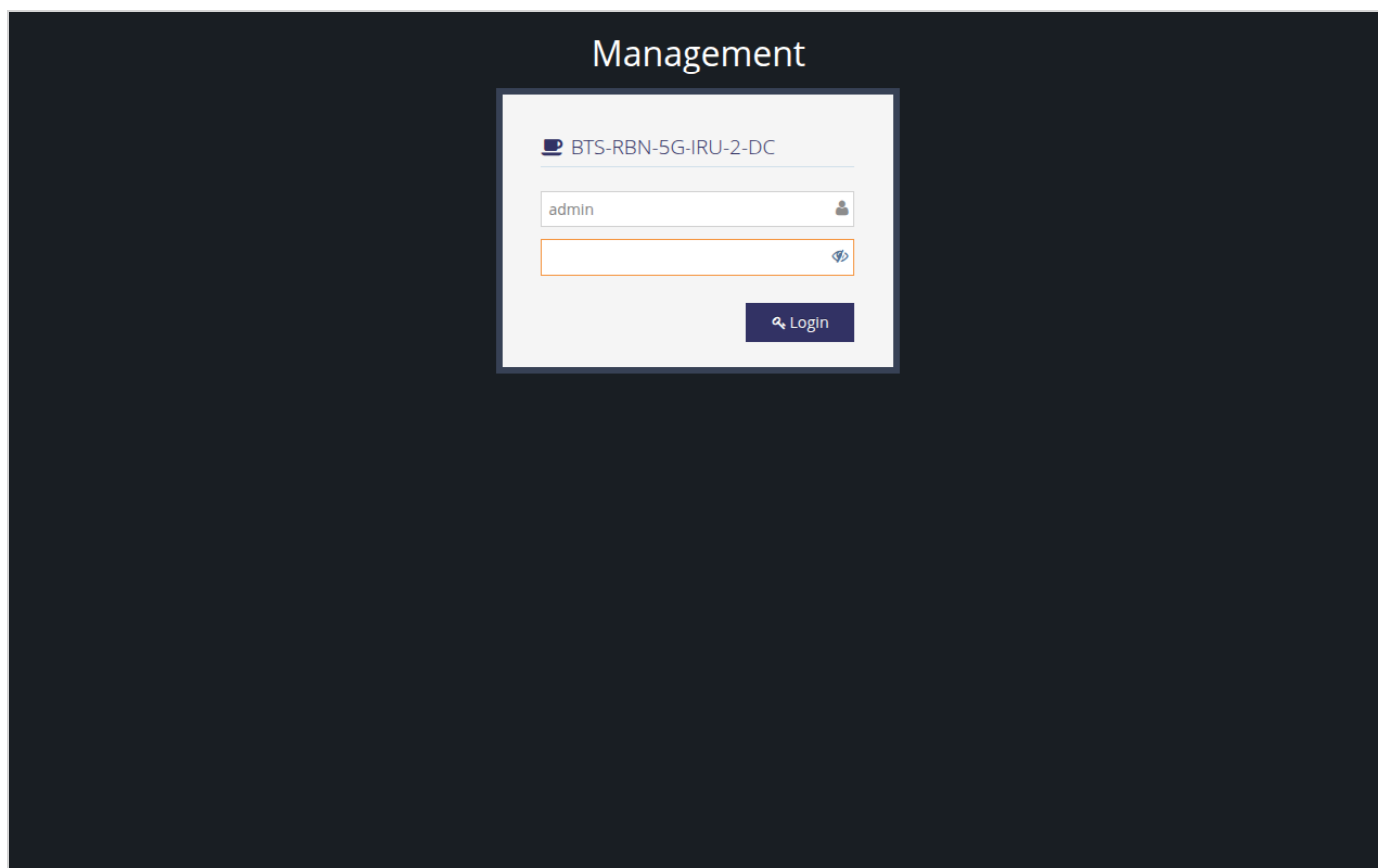
By Wi-Fi: join one of the two default networks, where *XXXXXX* is the last six digits of the unit's MAC address (also shown on System > Device):

Band	Default SSID	Security
2.4 GHz	BTS-RBN-XXXXXX	WPA/WPA2-PSK (AES)
5.8 GHz	BTS-RBN-5.8G-XXXXXX	WPA/WPA2-PSK (AES)

The factory Wi-Fi key is **bats2287** or **87654321**, depending on the factory configuration; try **bats2287** first. The key is not printed on the unit label. Change it during first-time setup.

Log in

1. Open a browser and go to **http://192.168.8.1**.
2. Enter username **admin** and password **admin**, then click **Login**.
3. The **Dashboard** opens. The left-hand menu holds every configuration page.



Login page

If the login page reports *Incorrect password*, the credentials have been changed. Contact BATS Wireless support to recover access; the enclosure has no external reset button.

First-time setup checklist

Work through these before deploying the unit.

- ☐ **Change the admin password** — **System > Password**. Enter the current password, the new one twice, and click **Modify**. You can change the username on the same page.
- ☐ **Change the Wi-Fi key** — **Wireless > 2.4G SSID** and **Wireless > 5.8G SSID** (section 6).
- ☐ **Set the time zone** — **System > Device**. The factory default is UTC+8; pick your local zone and click **Apply**.
- ☐ **Set the Wi-Fi country** — the radios ship set to China (CN). Set your country on each SSID page so channels and power follow local rules.
- ☐ **Disable Telnet** — **System > Telnet Server**. Telnet (port 23) is on by default and sends credentials in clear text. Enable **SSH Server** instead if you need a shell.
- ☐ **Check the APN** — **Network > LTE/NR**. The router picks an APN automatically from its built-in carrier list; set a custom APN only if your carrier requires one (section 5).

- ☐ **Back up the configuration** — **System > Configure > Backup Configure** (section 8).

Logging out

Click the logout icon (arrow leaving a box) at the top right of the page. Sessions also end when the router reboots.

4. Web interface tour

The left-hand menu groups about 50 pages into 11 menus; the three status pages at the top (Dashboard, Utilization, Interface) are read-only and the rest are settings. Most settings pages end with **Refresh** (reload saved values) and **Apply** (save and activate).

Menu map

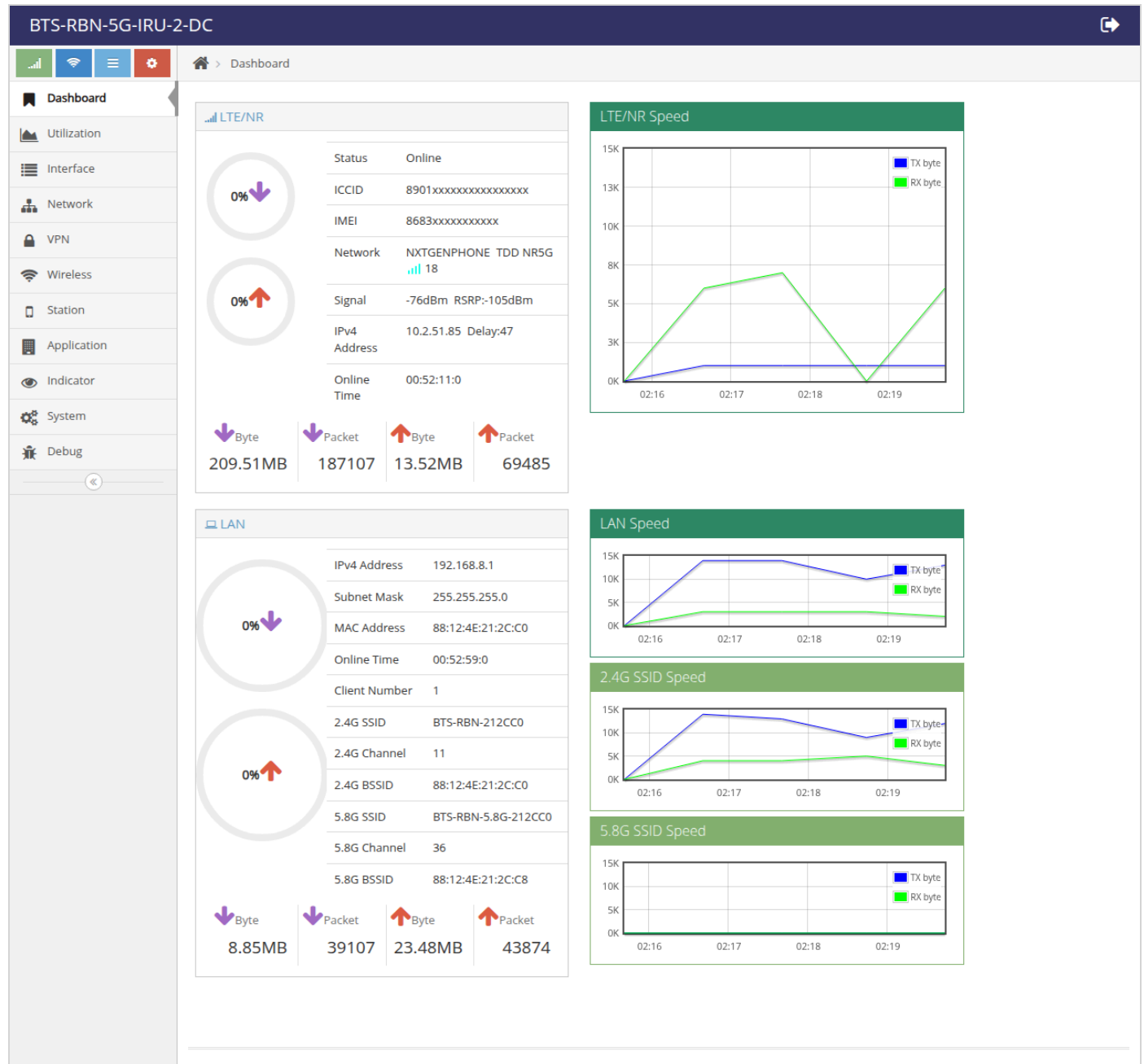
This is the menu in the default **LTE/NR Gateway** mode. Other operation modes (section 8) add or remove Network pages such as WAN and WISP.

Menu	Pages	Covered in
Dashboard	Live summary of every interface	This section
Utilization	CPU and memory load	This section
Interface	Detailed per-interface status, including modem radio data	This section
Network	LTE/NR, LTE/NR SMS, LAN, Hosts, ALG, Time to Live (TTL), Firewall, Port Map, Port Proxy, Route Table, Advanced Routing	Sections 5 and 6
VPN	IPSEC Connection, OpenVPN Client, WireGuard, L2TP Client, PPTP Client, GRE Tunnel	Section 6
Wireless	2.4G SSID, 2.4G MSSID, 2.4G ApClient, 2.4G Clients, and the same four for 5.8G	Section 6
Station	Station List, Access Control, Internet Control	Section 6
Application	DDNS, Dynamic Routing, HA (VRRP), AT Port Agent, SNMP Agent, UPNP, IGMP Proxy, Multicast Routing, HW Accelerate, Portal Show	Sections 5–7
Indicator	LED Light, Camera OSD, Camera GPS	Sections 7 and 8
System	Device, Configure, Software, Password, Auto Reboot, Web Server, Telnet Server, SSH Server, Local Control, Remote Agent, Zero Touch Provisioning, File Server	Sections 7 and 8
Debug	Syslog, Diagnostic, Terminal, AT command (LTE/NR), CA Center	Section 8

Four shortcut buttons above the menu jump to common pages: **LTE/NR** (signal icon), **Wireless** (Wi-Fi icon), **Interface** (list icon) and **System > Device** (gear icon). The header bar shows the device name, with the logout icon at the top right.

Dashboard

The Dashboard is the home page and refreshes itself. It shows one panel per active interface.



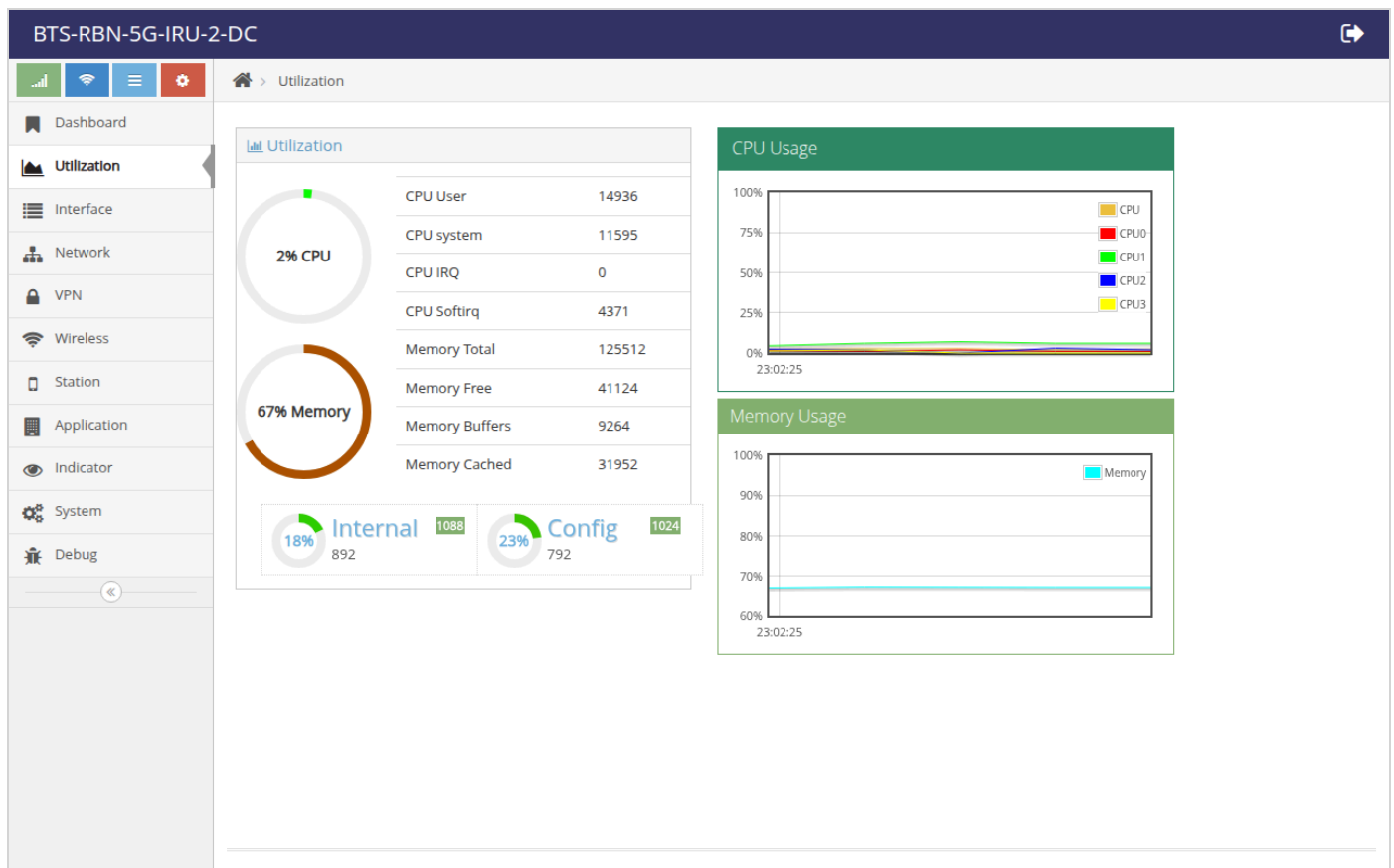
Dashboard

Panel	Fields
LTE/NR	Status, ICCID, IMEI, Network (operator and technology), Signal, IPv4 Address, Online Time, received and sent bytes/packets, live speed graph
LAN	IPv4 Address, Subnet Mask, MAC Address, Online Time, Client Number, 2.4G and 5.8G SSID / Channel / BSSID, live speed graphs for LAN and each SSID

WAN, WAN2 and WISP panels appear only in modes that use them.

Utilization

Shows CPU load (user, system, IRQ, softirq) and memory (total, free, buffers, cached) as live charts. A healthy idle unit sits at a few percent CPU with about 40 MB of its 128 MB free.



Utilization

Interface

The most detailed status page, and the one to check when diagnosing signal or connection problems.

BTS-RBN-5G-IRU-2-DC

Signal

Wi-Fi

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LTE/NR

Status

Online

Pause

Wrench

Network

NXTGENPHONE TDD NR5

18

ICCID

8901xxxxxxxxxxxxxx

RSSI

-76dBm RSRP:-105dBm

RSRQ/SINR

RSRQ:-11dB SINR:-18dB

Band

NR5G BAND 77

5G Network

NR5G-NSA

18

5G RSRQ/SINR

RSRQ:-11,658080,77,10,1dB SINR:-19dB

Delay

47ms

IPv4 Address

10.2.51.85

Subnet Mask

255.255.255.252

Gateway

10.2.51.86

IPv4 DNS

208.67.222.222

IPv4 DNS2

208.67.220.220

Rx/Tx

209.52MB / 13.52MB

Online Time

00:52:16:0

Modem

Quectel-0801

IMEI

8683xxxxxxxxxx

IMSI

3101xxxxxxxxxx

LAC

4E0B

CI

2EE45C1

LAN

Status

Online

Wrench

MAC Address

88:12:4E:21:2C:C0

IPv4 Address

192.168.8.1

Subnet Mask

255.255.255.0

Rx/Tx

8.87MB / 23.6MB

Switch

LAN

✓

WAN

✗

Interface page

Block	Key fields
LTE/NR Modem	Status, Network (e.g. TDD NR5G), ICCID, RSSI, RSRQ/SINR, Band; for 5G NSA also 5G Network, 5G RSSI, 5G RSRQ/SINR, 5G Band; Modem firmware, IMEI, IMSI, LAC, CI, ARFCN
LTE/NR	Delay (link latency, ms), IPv4 Address, Subnet Mask, Gateway, DNS, IPv6 mode/addresses/gateway/DNS, Rx/Tx, Online Time
LAN	Address, mask, MAC, traffic, online time
Switch	Link state of each Ethernet port

Reading the signal values

The router reports standard 3GPP measurements. Use these typical ranges to judge antenna placement; RSRP and SINR matter most.

Metric	Excellent	Good	Fair	Poor
RSRP (dBm)	≥ -80	-80 to -90	-90 to -100	< -100
RSRQ (dB)	≥ -10	-10 to -15	-15 to -20	< -20
SINR (dB)	≥ 20	13 to 20	0 to 13	< 0

In 5G NSA mode the page shows two sets of values: the LTE anchor and the 5G NR carrier (the 5G fields). Both must be usable for full 5G speeds.

5. Cellular (5G/LTE) configuration

All cellular settings live on **Network > LTE/NR**; with a supported carrier SIM the defaults connect without changes. The router matches the SIM to its built-in list of 400+ operators and fills in the APN and dial number itself.

Status block

The top of the page shows **Status** (e.g. Online, Searching, NO SIM, Need PIN), **IPv4 Address**, **Network** (operator, technology and signal bars), **RSSI/RSRP**, **ICCID**, **IMEI**, **Online Time** and **Rx/Tx** totals. The pause button next to Status disconnects the cellular link until pressed again.

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Network > LTE/NR

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LTE/NR SMS

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Debug

Status	Online ⏸	IPv4 Address	10.2.51.85
Network	NXTGENPHONE TDD NR5G 📶 18	RSSI	-76dBm RSRP:-105dBm
ICCID	8901xxxxxxxxxxxxxx	IMEI	8683xxxxxxxxxx
Online Time	00:52:25:0	Rx/Tx	209.78MB / 13.56MB

APN Custom ⏸

Attach Mode Auto

GNSS ⏸

AT Port ⏸

Modem Settings

Network Status ✓

IPv4 Mode Advise

IPv4 Masquerade(NAT) ✓

MTU

Availability Check ICMP

Test Address 8.8.4.4

Test Address 2 114.114.115.115

Test Address 3 223.6.6.6

Each Query Timeout(sec) 10

Test Times 6

Test Interval(sec) 2

Failed TODO Reconnection

Refresh

Apply

Network > LTE/NR

APN and dialing

Turn on **APN Custom** only when your carrier needs a specific APN (common for private networks, IoT plans and MVNOs).

Field	Values	Notes
APN	Text, up to 128 characters	From your carrier
Username / Password	Text	Usually blank
IP Type	IP, IPv4v6, IPv6	IP = IPv4 only
Authentication	Auto, None, PAP, CHAP, PAP&CHAP	Auto works for most carriers
Dial Number	e.g. *99***1#	Leave blank unless told otherwise
Attach Mode	Auto, NSA(5G), SA(5G), LTE(4G), WCDMA, TDSCDMA, EVDO, CDMA, GSM	Forces a radio technology; default Auto
GNSS	On/Off	Leave off; no GNSS antenna on this enclosure
AT Port	On/Off	Exposes the modem's AT port to the AT Port Agent application

Force **LTE(4G)** if 5G signal is weak and unstable, or **SA(5G)** if your carrier offers standalone 5G and you want to avoid the LTE anchor.

Modem Settings

The **Modem Settings** button opens advanced modem controls.

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Network > LTE/NR

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PIN Code

Lock IMEI

Unlocked

Lock

Lock IMSI

Unlocked

Lock

Lock Band

Lock Cell

Custom setting AT

Command Name

AT Command

Return

No records to view

Custom watching AT

Command Name

AT Command

Return

No records to view

Need SIM Card

Frist number of simcard failures reset modem

Second number of simcard failures reset modem

Third number of simcard failures reset modem

Interval number of simcard failures reset modem

Need PLMN

Need Signal

Frist number of signal failures reset modem

Second number of signal failures reset modem

Third number of signal failures reset modem

Interval number of signal failures reset modem

Watch interval

Dial timeout

45

Frist number of dial failures reset modem

3

Second number of dial failures reset modem

15

Interval number of dial failures reset modem

37

Refresh

Apply

Modem Settings

Setting	Purpose
PIN Code	SIM PIN, if the SIM is PIN-locked
Lock IMEI / Lock IMSI	Binds the configuration to this modem or this SIM so a swapped SIM or module will not connect
Lock Band	Restricts the modem to listed bands
Lock Cell	Restricts the modem to a specific cell
Need SIM Card / Need PLMN / Need Signal	When on, the router resets the modem after repeated failures to detect a SIM, register on a network, or get signal
Failure thresholds	Number of SIM, signal or dial failures before the first, second and third modem reset, and the interval for repeated resets
Watch Interval	How often the modem state is checked
Dial timeout	Seconds allowed for one dial attempt (default 45)

With default settings the modem is reset after 3 failed dial attempts, again after 15, then every 37.

Network settings

Turning on **Network Status** reveals the IP-layer settings. The defaults suit almost every carrier.

Setting	Default	Notes
IPv4 Mode	Advise	Advise lets the router choose; also DHCP, Static IP, PPP
LCP Echo Interval / Times	10 s / 12	PPP mode only
Custom DNS	Off	Override carrier DNS with your own two servers
IPv4 Masquerade (NAT)	On	Turn off only for routed or framed-route SIMs
MTU	Blank (automatic)	Lower to 1400–1420 if VPNs stall
IPv6 Mode	Disable	Automatic or Manual when the carrier provides IPv6

Availability Check (link keep-alive)

The router constantly tests that the cellular link really passes traffic, not just that it is registered. When a test fails the set number of times, it takes the **Failed TODO** action: Reconnection (default), Reset Modem, or Reboot System.

Availability Check	ICMP
Test Address	8.8.4.4
Test Address 2	114.114.115.115
Test Address 3	223.6.6.6
Each Query Timeout(sec)	10
Test Times	6
Test Interval(sec)	2
Failed TODO	Reconnection

Availability Check settings on Network > LTE/NR (factory defaults)

Method	How it tests	Defaults
ICMP	Pings up to three test addresses	8.8.4.4, 114.114.115.115, 223.6.6.6; 10 s timeout, 6 failures, 2 s interval
UDP&TCP	DNS queries	8 s timeout, 6 failures, 2 s interval
Receive Count	Counts received packets	Fails if fewer than 1 packet in 20 s, 30 times
Auto / Disable	Firmware chooses / no checks	—

Two default ICMP targets are servers in China. Outside China, replace Test Address 2 and 3 with reachable targets such as 1.1.1.1 and 9.9.9.9, or a host on your own network.

SMS

Network > LTE/NR SMS lists received text messages (contact, ID, date, content) and can delete them. Turn on **SMS Function** to receive. **HE Agent** lets an authorized phone number (**Command Contact**) send configuration commands by SMS; each message must start with the **Command Prefix**. Use a hard-to-guess prefix if you enable it.

AT commands

Debug > AT command (LTE/NR) opens an interactive terminal to the modem. Use it for diagnostics such as AT+QENG="servingcell" (serving-cell details) or AT+QNWPREFCFG (band and mode preferences on Quectel modules). Close the terminal before leaving the page. Changes made directly by AT command can conflict with the router's own modem management.

GNSS (GPS)

The modem has a GNSS receiver, but this enclosure has no GNSS antenna, so leave **GNSS** off on the LTE/NR page.

6. Network configuration

The Ethernet port and both Wi-Fi radios are bridged into one 192.168.8.0/24 network behind the cellular link, with the router's firewall dropping unsolicited traffic from the internet by default. This section covers the local network, Wi-Fi, clients, firewall and forwarding, routing, and VPN.

LAN (Network > LAN)

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Debug

IPv4 Address

192.168.8.1

Subnet Mask

255.255.255.0

Address 2

x

Address 3

x

DHCP Server

Start IP Address

192.168.8.2

End IP Address

192.168.8.250

Lease(Sec)

86400

Assign Gateway

Assign DNS

Assign DNS2

DHCP Server Options(separated by semicolons)

Refresh

Apply

Network > LAN

Setting	Default	Notes
IPv4 Address / Subnet Mask	192.168.8.1 / 255.255.255.0	Changing it moves the web interface; reconnect at the new address
Address 2 / Address 3	Blank	Extra router addresses on other subnets
DHCP Server	On	
Start / End IP Address	192.168.8.2 / 192.168.8.250	
Lease (Sec)	86400 (24 h)	
Assign Gateway / DNS / DNS2	Blank (router itself)	Hand out different values to clients
DHCP Server Options	Blank	Raw dnsmasq-style options, separated by semicolons
IPv6 Mode	Disable	Relay or Manual, with optional DHCPv6 server

Network > Hosts adds local DNS names (hostname to IP). Clients must use the router as their DNS server for these names to resolve.

Wi-Fi

The 2.4 GHz and 5.8 GHz radios each have an **SSID** page (main network and radio settings), an **MSSID** page (second and third SSID), an **ApClient** page (connect to another Wi-Fi as a client), and a **Clients** page (connected devices with RSSI, traffic and a kick option).

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2.4G SSID

2.4G MSSID

2.4G ApClient

2.4G Clients

5.8G SSID

5.8G MSSID

5.8G ApClient

5.8G Clients

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Debug

Wireless > 2.4G SSID

Status

☒

SSID

BTS-RBN-212CC0

Security Mode

Mixed WPA-PSK(Private)

WPA Mode

AES

Password

Hide SSID

☐

Isolate Clients

☐

Clients ACL

ACL Settings

Mode

11BGN

Band Width

40

Country

CHINA

Channel

11

Beacon

300

DTIM

1

STBC

☒

Short GI

☒

Tx Power

Default

Refresh

Apply

Wireless > 2.4G SSID (the 5.8G SSID page is identical)

Setting	2.4 GHz default	5.8 GHz default	Options
SSID	BTS-RBN-XXXXXX	BTS-RBN-5.8G-XXXXXX	Up to 32 characters
Security Mode	Mixed WPA-PSK	Mixed WPA-PSK	Disable (None), WPA-PSK, WPA2-PSK, Mixed WPA-PSK
WPA Mode	AES	AES	TKIP, AES, Auto
Mode	802.11b/g/n	802.11ac	Per band
Band Width	40 MHz	80 MHz	Per band
Channel	11	36	Auto or fixed
Country	China	China	Set to your country
Beacon / DTIM	300 / 1	100 / 1	
Max clients	32	32	Per SSID

Other per-SSID options: **Hide SSID**, **Isolate Clients** (stops clients talking to each other), **Clients ACL** (MAC allow/deny list), WMM and WPS. Radio options: STBC, Short GI and Tx Power.

Use **WPA2-PSK** with **AES** for the best compatibility and security, and disable WPS if it is not needed.

Clients (Station menu)

Page	Purpose
Station List	Every connected device: hostname, MAC, IP, online time, traffic, and interface (LAN or which SSID)
Access Control	Rules that allow or block a source device from destinations, domains or keywords, by port and schedule (dates, times, weekdays)
Internet Control	Per-device internet access: No Setting, Allow, Forbidden, or Time Internet (allowed only on a schedule)

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Signal

Wi-Fi

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Online Number(1)

☐	Hostname	MAC Address	IP Address	Online Time	Rx/Tx	IFdev	Operation
☐	laptop	38:BA:F8:58:E5:1C	192.168.8.86	00:39:35	9.72MB / 6.68MB	SSID(2.4G)	

+

✎

🔍

🗑

View 1 - 1 of 1

The <delete> here will clear the station of all configure

Station > Station List

Firewall (Network > Firewall)

The firewall applies to the external (cellular) interface. Defaults are secure: **Default Action = Drop** for anything not explicitly allowed.

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Network > Firewall

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Status

☒
☐

Default Action

Drop

ICMP Access

☐
☒

IPSEC Access

☐
☒

Telnet Access

☐
☒

SSH Access

☐
☒

WEB Access

☐
☒

ICMP Through

☐
☒

IPSEC Through

☐
☒

NAT Through

☒
☐

Action Rule Table

☐

Name(unique)

Extranet Address

Intranet Address

Protocol

Intranet Port

Action

Operation

+

No records to view

Refresh

Apply

Network > Firewall

Option	Effect when on
ICMP Access	Router answers ping from the internet
IPSEC Access	Router accepts IPsec from the internet
Telnet / SSH / WEB Access	Router's Telnet, SSH or web interface reachable from the internet
ICMP Through / IPSEC Through	Passes ping or IPsec through to LAN devices
NAT Through	Lets port-mapped traffic reach LAN devices

The rule table adds exceptions by extranet address, intranet address, protocol and port, with an Accept or Drop action. Only enable WEB Access from the internet after changing the admin password, and preferably restrict it to known source addresses with a rule.

Most carrier SIMs use carrier-grade NAT (a private 10.x or 100.64.x address). Inbound access from the internet then needs a public/static-IP SIM, or a VPN.

Port forwarding

Page	Direction	Use
Port Map	Internet to LAN	Forward an external port to a LAN device (Name, Port, Protocol, Intranet Address, Intranet Port). Also sets a DMZ Host that receives all unmatched inbound traffic
Port Proxy	LAN to internet	Listen on a router port and relay it to an internet address and port
ALG	—	Protocol helpers for NAT. On by default: FTP, PPTP, GRE, RTSP, SIP. Off: H.323, SNMP, TFTP, Amanda, IRC, UDP-Lite
Time to Live (TTL)	—	Fix, increase or decrease the TTL of forwarded packets

BTS-RBN-5G-IRU-2-DC
↗

- Dashboard
- Utilization
- Interface
- Network**
 - LTE/NR
 - LTE/NR SMS
 - LAN
 - Hosts
 - ALG
 - Time to Live(TTL)
 - Firewall
 - Port Map**
 - Port Proxy
 - Route Table
 - Advanced Routing
- VPN
- Wireless
- Station
- Application
- Indicator
- System
- Debug

Interface
LTE/NR

Mode
DNAT

DMZ Host Address

NAT Rule Table
^

☐	Name(unique)	Port	Protocol	Intranet Address	Intranet Port	Operation
+ ✎ ✖						
No records to view						

Warning: Firewall can enable the ports of the NAT/DMZ table

Refresh
Apply

Network > Port Map

Routing

Page	Purpose
Route Table	Static routes: destination, mask, gateway, interface, metric
Advanced Routing	Policy routing: mark traffic by source/destination IP, protocol and port, then send marked or sourced traffic to a separate routing table
Application > Dynamic Routing	RIPv1/v2 and OSPFv2 (router ID, interface table, RFC 1583 compatibility, raw options)
Application > HA (VRRP)	Pairs two routers behind one virtual IP (default 192.168.8.254/24). Set one to Master and one to Backup with the same Device Group ID

VPN

Each VPN page lists its tunnels with status, addresses and traffic; click **+** to add one and open it to edit. Every tunnel type offers **IP Masquerade (NAT)**, **Default Route** (send all traffic through the tunnel), **Route Table** and **Custom DNS**.

Type	Key settings
IPSEC Connection	Peer address and network; local and peer identifiers; Aggressive Mode; NAT-T; Pre-Shared Key or certificates; IKEv1/IKEv2; IKE and IPsec authentication (MD5 to SHA512, AES-XCBC), encryption (DES to AES256), DH group (1–18) and lifetimes; AH or ESP; Dead Peer Detection
OpenVPN Client	Server, port, UDP/TCP, TUN/TAP, subnet or point-to-point topology, cipher, LZO; auth by static key, certificate or username/password; TLS-Auth; CA, client cert and key upload; custom options
WireGuard	Key pair, listen port, local addresses, MTU, peers
L2TP Client	Server, port, username/password, tunnel auth (none, simple, challenge) and secret, MTU, LCP echo
PPTP Client	Server, username/password, MPPE encryption, MTU, LCP echo
GRE Tunnel	Peer address, local and remote tunnel IPs, MTU, TTL

Prefer WireGuard, IPsec (IKEv2, AES256, SHA256, DH14+) or OpenVPN with certificates. PPTP and plain GRE are not secure on their own.

Certificates for IPsec and OpenVPN can be generated on the router under **Debug > CA Center**.

Other network services

Page	Purpose
Application > DDNS	Up to three dynamic DNS clients (provider, domain, username, password); shows the domain's IP vs the current external IP
Application > UPNP	Lets LAN devices open ports automatically. Off by default; leave off unless needed
Application > IGMP Proxy / Multicast Routing	Multicast forwarding for IPTV or video streams
Application > HW Accelerate	Hardware NAT offload: Enable, Ethernet only, or Disable. On by default for full 5G throughput
Application > Portal Show	Captive portal splash page for LAN clients, with timeouts and white lists

7. Applications and management services

Beyond routing, the router offers network-based applications for monitoring and remote management, found in the **Application**, **Indicator** and **System** menus. The firmware also contains serial-port, Remote IO and GNSS applications; these have no connection on this enclosure and should be left disabled.

AT Port Agent (Application > AT Port Agent)

Exposes the modem's AT command port over the network, as a client to a server or as a local TCP server, so remote tools can query the modem. Requires **AT Port** to be on in Network > LTE/NR. Do not expose it to the internet.

SNMP (Application > SNMP Agent)

Off by default. Settings: port (161), read-only and read-write community strings (defaults "rocommunity" and "rwcommunity" — change both), SNMPv3 with MD5/SHA authentication and DES/AES privacy, and system name, contact and location. Custom OIDs under .1.3.6.1.4.1.2022.5xx report model, name, firmware, MAC, LAN IP and modem identifiers.

Camera integration (Indicator menu)

Camera OSD writes live data (cellular status, GPS, sensor values or custom text) onto up to four on-screen-display lines of a Hikvision, Univision or ViewSheen IP camera. **Camera GPS** pushes NMEA position to the camera at a set interval. Both are off by default; enter the camera's IP address and credentials to use them.

Management agents (System menu)

Page	Purpose	Default
Local Control	Responds to LAN discovery broadcasts (UDP 22222) and an optional JSON command port (22220), used by management tools to find and configure units	Broadcast on, JSON off
Remote Agent	Connects to a cloud management server (HTTP agent, HE agent, port mapping)	Off
Zero Touch Provisioning	Loads configuration at boot from DHCP options, local storage (ztp.json) or a URL	DHCP and storage on, URL off
File Server	SAMBA and FTP shares for attached storage	Off

Leave **Remote Agent** off unless instructed by BATS Wireless support. Consider turning off Local Control broadcast responses on untrusted LANs.

8. System administration

Day-to-day administration is under **System** and **Debug**. Note that by default the router reboots itself every few days (see Auto Reboot below).

Device (System > Device)

Shows **Device Name** (editable), **Model**, **Date Code**, **MAC Address**, **Current Time**, **Time Source** and **Run Time**, with a **System Reboot** button.

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System > Device

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Password

Zero Touch Provisioning

Remote Agent

Local Control

Auto Reboot

File Server

Telnet Server

SSH Server

Web Server

Debug

Device Name

BTS-RBN-5G-IRU-2-DC

Modify

Model

V528P

Date Code

20260825

MAC Address

88:12:4E:21:2C:C0

Current Time

23:03:06 (10/15/2026)

Copy from computer

Time Source

NTP Server

Run Time

00:54:02

System Reboot

Operation Mode

LTE/NR Gateway

Time Zone

UTC+8(EAT - China Standard Time(BJT))

NTP

☒

Sync

NTP Server

cn.pool.ntp.org

NTP Server2

time.windows.com

NTP Server3

ntp.aliyun.com

NTP Service

☐

Refresh

Apply

System > Device

Setting	Default	Notes
Operation Mode	LTE/NR Gateway	Changing it reboots the router (see below)
Language	English	English or Chinese; not changed by a factory reset
Time Zone	UTC+8	Set to your local zone
NTP	On	Servers: cn.pool.ntp.org, time.windows.com, ntp.aliyun.com; syncs every 24 h
NTP Service	Off	Lets LAN devices use the router as their time server

Copy from computer sets the clock from your browser when NTP is unavailable.

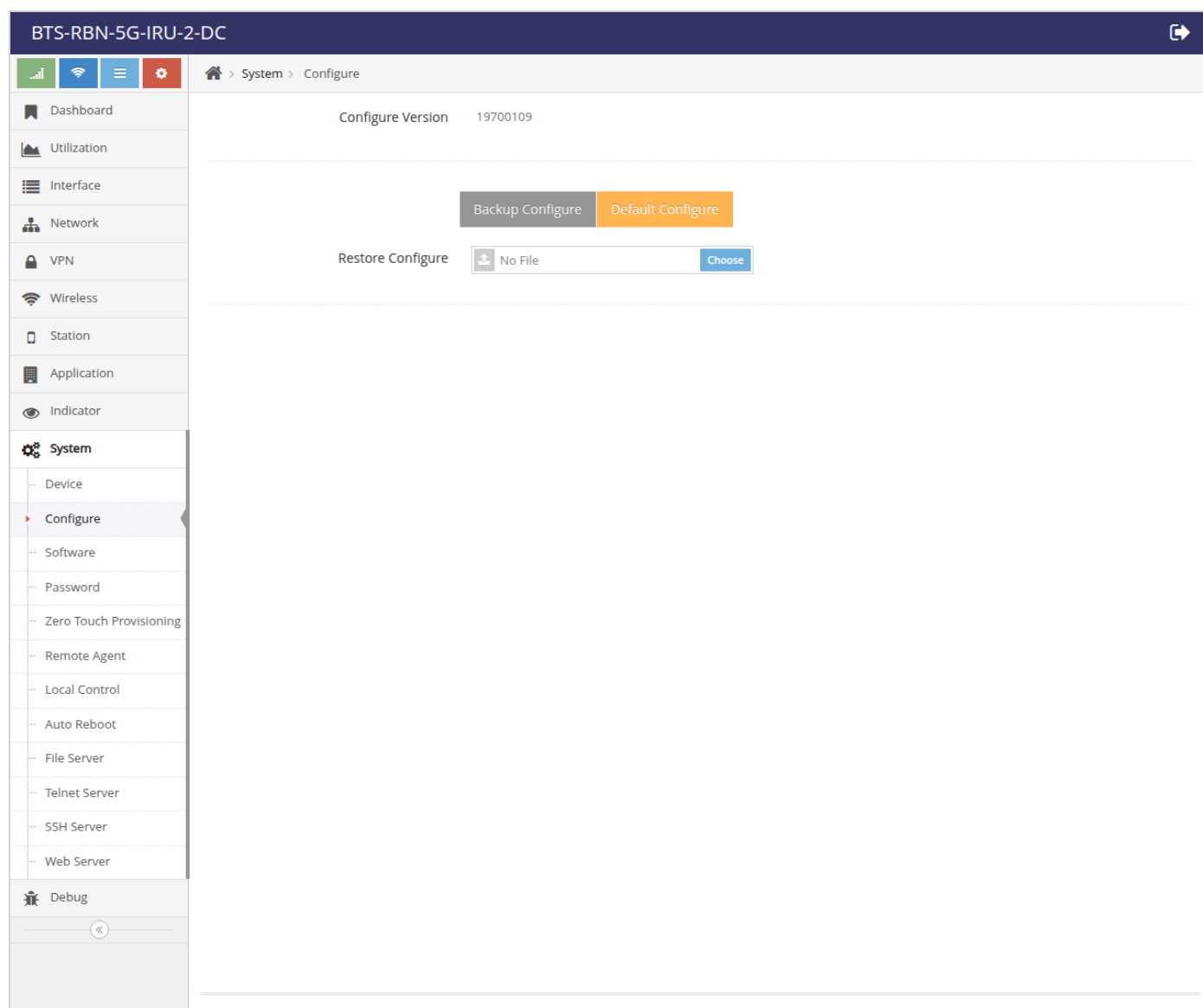
Operation modes

Mode	Internet source	Use when
LTE/NR Gateway (default)	5G/LTE modem	Standard cellular router
Gateway	Ethernet WAN port	Wired internet, no cellular
2.4G WISP Gateway	Another Wi-Fi network (2.4 GHz)	Wireless uplink
LTE/NR Modem	5G/LTE, bridged	Pass the cellular connection to a downstream router
AP	None (bridge)	Pure Wi-Fi access point on an existing LAN
Mix	Several	Combined uplinks with backup or load balancing

The Network menu changes to match the selected mode, for example adding WAN or WISP pages.

Configuration backup and restore (System > Configure)

Button	Action
Backup Configure	Downloads the current configuration file
Restore Configure	Uploads a saved configuration file and applies it
Default Configure	Resets to the saved <i>default</i> configuration
Save Default Configure	Saves the current settings as the new default
Restore Default Configure	Uploads a file to use as the default configuration
Factory Configure	Resets to the original factory configuration



System > Configure

Save Default Configure is useful for fleets: set up one unit, save it as the default, and the reset button will then return it to your baseline instead of factory settings.

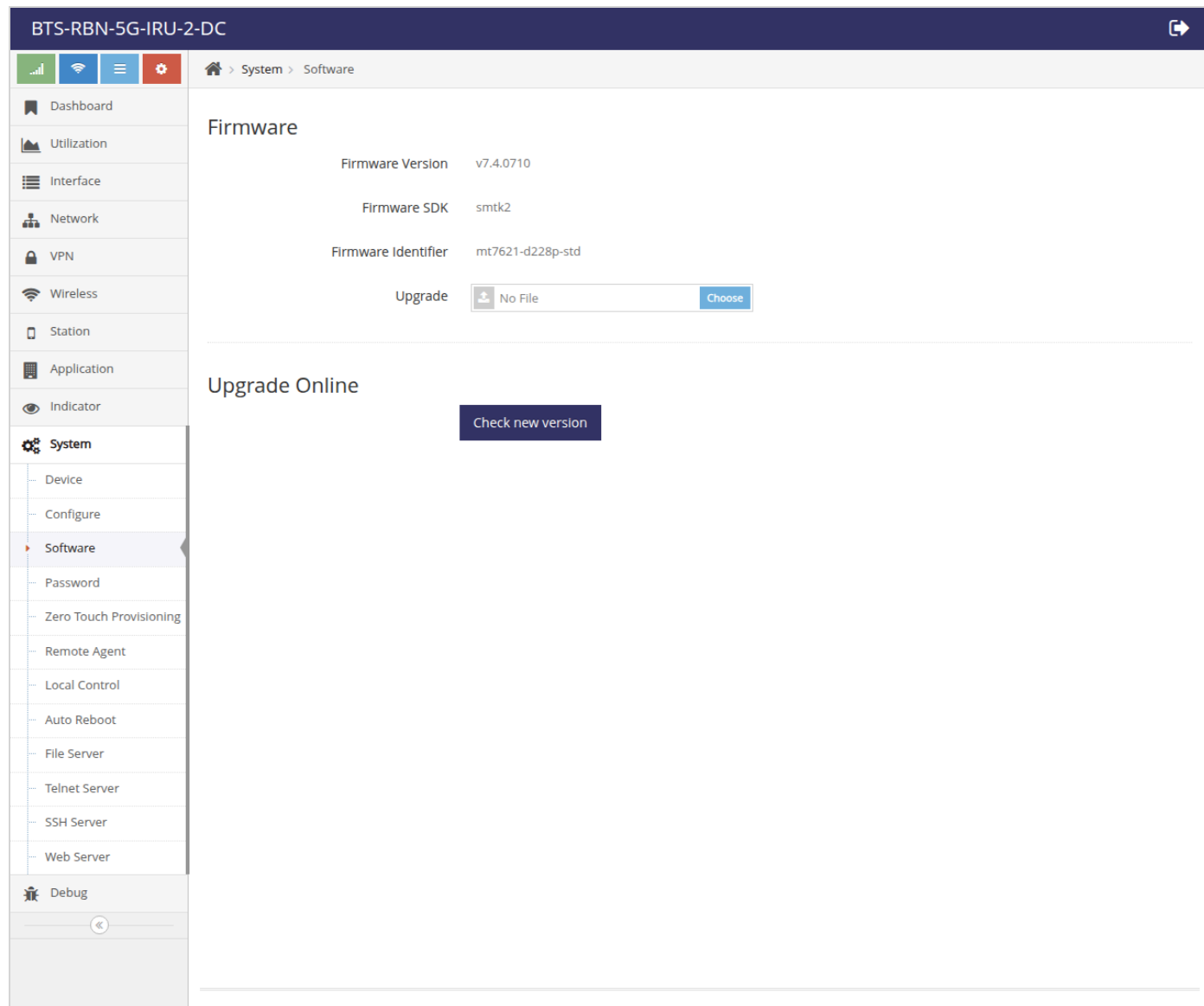
Factory reset

To restore factory settings, log in and click System > Configure > **Factory Configure**. The router restores defaults and reboots.

After a reset the LAN returns to 192.168.8.1 and the login to admin/admin.

Firmware (System > Software)

The page shows **Firmware Version**, **Firmware SDK** and **Firmware Identifier**.



The screenshot shows the BATS router web interface for the model BTS-RBN-5G-IRU-2-DC. The left sidebar contains a navigation menu with categories: Dashboard, Utilization, Interface, Network, VPN, Wireless, Station, Application, Indicator, System, and Debug. The 'System' category is expanded, showing sub-items: Device, Configure, Software (selected), Password, Zero Touch Provisioning, Remote Agent, Local Control, Auto Reboot, File Server, Telnet Server, SSH Server, and Web Server. The main content area is titled 'Firmware' and displays the following information:

Firmware Version	v7.4.0710
Firmware SDK	smtk2
Firmware Identifier	mt7621-d228p-std
Upgrade	No File Choose

Below the 'Firmware' section, there is an 'Upgrade Online' section with a button labeled 'Check new version'.

System > Software

1. Obtain firmware for this model from BATS Wireless support.
2. Back up the configuration.
3. Under **Upgrade**, choose the file and confirm. Keep power stable until the router reboots (several minutes).

Upgrade Online checks the firmware update server for newer firmware and shows its change log. The bootloader is recoverable, so an interrupted upgrade can be retried. The **Current FPK List** shows installed feature packages; **Default FPK&Configure** returns both packages and configuration to factory state.

Password (System > Password)

Changes the admin username and password. Enter the original password and the new one twice, then click **Modify**.

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System

- Device
- Configure
- Software
- Password
- Zero Touch Provisioning
- Remote Agent
- Local Control
- Auto Reboot
- File Server
- Telnet Server
- SSH Server
- Web Server

Debug

> System > Password

Username

admin

Original Password

New Password

Repeat New Password

Refresh

Modify

System > Password

Auto Reboot (System > Auto Reboot)

Mode	Behavior
Disable	Never reboot on a schedule
Idle Reboot (default)	After a minimum run time, reboot once no clients have been connected for a set duration; force a reboot at a maximum run time
Age	Reboot after a fixed run time
Point	Reboot daily at a set time, once a minimum run time has passed

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SSH Server

Web Server

Debug

System > Auto Reboot

Reboot Mode

Idle Reboot

Minimum running time(sec)

208800

None Client duration(sec)

300

Point Reboot Time

3

30

Maximum running time(sec)

295200

Refresh

Apply

System > Auto Reboot

Factory defaults for Idle Reboot: minimum run time 208,800 s (58 h), no-client duration 300 s, maximum run time 295,200 s (82 h). Choose **Point** with a quiet-hours time if scheduled downtime matters, or **Disable** for always-on links.

Remote access services

Page	Default	Settings
Web Server	HTTP on port 80	HTTP and HTTPS (with SSL port), allowed source addresses
Telnet Server	On, port 23	Port, allowed source addresses
SSH Server	Off, port 22	Port, allowed source addresses

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SSH Server

Web Server

Debug

System > Telnet Server

Telnet Server

Designated Address Access

Port 23

Refresh

Apply

System > Telnet Server

Enable HTTPS and SSH, disable Telnet, and use **Designated Address Access** to limit who can connect.

Command-line interface

Telnet and SSH give a configuration shell (log in with the admin credentials). It reads and writes the same settings as the web interface.

Command	Meaning	Example
@	List all software projects	
\	Show a component's configuration	ifname@lan
\:	Read one setting	land@machine:version returns v7.4.0710
\.status	Live status	ifname@lte2.status:rsrp returns -107
\:=\	Change a setting	Use with care; changes apply immediately

Useful components: ifname@lte2 (cellular link), modem@lte2 (modem), ifname@lan (LAN), wifi@nssid and wifi@ssid (2.4/5.8 GHz SSIDs), forward@firewall, land@machine.

Debug tools

Page	Purpose
Syslog	Log storage (memory, internal or external storage), max size, level (Error to Verbose), log types, and forwarding to a remote syslog server (UDP 514)
Diagnostic	Ping, traceroute, iperf2 throughput test (TCP 5001) and packet capture (tcpdump expression), each with a live terminal and downloadable results
Terminal	Web terminal to the router CLI
AT command (LTE/NR)	Direct modem AT terminal (section 5)
CA Center	Generates a CA, server certificates, Diffie-Hellman parameters, TLS-Auth and static keys for VPNs

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↗

🏠 > Debug > Diagnostic

- Dashboard
- Utilization
- Interface
- Network
- VPN
- Wireless
- Station
- Application
- Indicator
- System
- Debug
- Syslog
- Diagnostic
- Terminal
- AT command(LTE/NR)
- CA Center

Ping Address

Log Ping
Terminal Ping

Traceroute Address

Log Traceroute
Terminal Traceroute

Iperf2 Address(TCP:5001)

Log Iperf2
Terminal Iperf2

Capture Expression

Log Capture
Terminal Capture

Close before leave

Debug > Diagnostic

LED Light (Indicator > LED Light)

Turns the status LEDs around the Ethernet port on or off, for example for covert or light-sensitive installations.

9. Troubleshooting

Start with **Interface** (signal and link state) and **Debug > Syslog**; most problems show up in one of the two.

Cellular connection

Symptom (LTE/NR status)	Likely cause	Fix
NO Device	Modem not detected	Power-cycle; if it persists, the modem or its connector is faulty
NO SIM	SIM missing, upside down, or inserted while powered	Power off, reseal the SIM, power on
Need PIN / PIN Error	SIM is PIN-locked	Enter the PIN under Modem Settings; a PIN error needs the PUK from the carrier
NO Signal / Searching	No coverage, antennas missing or loose	Check all four cellular antennas; move the unit or antennas; try Attach Mode LTE(4G)
NO Register / DE Register	SIM not activated, wrong network, or blocked IMEI	Confirm the SIM is active for data and works in this region; check the carrier's device whitelist
Connecting, never Online	Wrong APN or authentication	Turn on APN Custom and enter the carrier's APN, user and password
Online but no internet	Availability check targets unreachable, or DNS problem	Use Diagnostic ping to 8.8.8.8 and a hostname; set Custom DNS; change test addresses
Online, but drops every few minutes	Weak or noisy signal; keep-alive targets blocked	Improve RSRP/SINR; replace the China-based ICMP test addresses (section 5)

Slow or unstable 5G

- Check SINR first on the Interface page. Below 0 dB the link will be slow and unstable even with good RSRP.
- Make sure all four cellular antennas are connected and spaced apart; MIMO needs all of them.
- In NSA mode, a weak LTE anchor drops the 5G carrier. Try forcing **LTE(4G)** to compare stability, or **SA(5G)** if the carrier supports it.
- Keep **HW Accelerate** enabled; without it the CPU limits throughput.

- Measure with **Diagnostic > Iperf2** against a known server to separate radio problems from LAN or Wi-Fi problems.

Access and login

Problem	Fix
Can't reach 192.168.8.1	Confirm the computer has a 192.168.8.x address from DHCP; try a wired connection; check whether the LAN address was changed
Login says Incorrect password	Contact BATS Wireless support; a factory reset from the web interface needs a working login
Page logs out unexpectedly	The router rebooted (Auto Reboot or watchdog); check Run Time on System > Device
Can't reach the router from the internet	Carrier NAT (private IP) blocks inbound traffic; use a static-IP SIM or a VPN. Also enable WEB Access on the firewall

Wi-Fi

Problem	Fix
Devices can't see the network	Check Hide SSID is off and the radio Status is on; move closer, as the internal antenna is short-range
Some 5.8 GHz channels unavailable or devices won't connect	Set Country to your country so the right channels are used
Slow 2.4 GHz	Use 20 MHz bandwidth in crowded areas and a clear channel (1, 6 or 11)
Devices connect but get no address	Check the LAN DHCP server is on and the pool is not exhausted

Unexpected reboots

- **Every 2–3 days:** the default Auto Reboot schedule (section 8).
- **After link failures:** the Availability Check action is set to Reboot System, or the dial-failure thresholds were reached.
- **Random:** check the power supply can deliver 2 A at 7–16 V without sagging, and that the DC connector is fully seated with correct polarity.

Collecting information for support

Before contacting support, note the firmware version (System > Software), modem firmware and signal values (Interface page), and download the system log (Debug > Syslog) and a configuration backup.

Appendix A. Factory default settings

Setting	Default
Web interface	http://192.168.8.1, port 80
Login	admin / admin
Operation mode	LTE/NR Gateway
LAN	192.168.8.1/24; DHCP pool 192.168.8.2–250; 24 h lease
2.4 GHz Wi-Fi	BTS-RBN-XXXXXX, WPA/WPA2-PSK AES, key bats2287 or 87654321, channel 11, 40 MHz
5.8 GHz Wi-Fi	BTS-RBN-5.8G-XXXXXX, WPA/WPA2-PSK AES, same key as 2.4 GHz, channel 36, 80 MHz
Wi-Fi country	China
Cellular	Automatic APN, Attach Mode Auto, NAT on, IPv6 off
Link check	ICMP to 8.8.4.4, 114.114.115.115, 223.6.6.6
Firewall (cellular side)	On, default Drop
Time zone / NTP	UTC+8; NTP on
Auto Reboot	Idle Reboot (58 h minimum, 82 h maximum)
Telnet / SSH	On (port 23) / Off (port 22)
SNMP, UPnP, DDNS, VPNs, Remote Agent	Off

Appendix B. Network ports used by the router

Port	Protocol	Service	Default
22	TCP	SSH	Off
23	TCP	Telnet	On (LAN)
80	TCP	Web interface	On (LAN)
161	UDP	SNMP	Off
514	UDP	Remote syslog (outbound)	Off
5001	TCP	iperf2 test (outbound)	On demand
22220	UDP/TCP	Local Control JSON agent	Off
22222	UDP	Local Control discovery broadcast	On (LAN)

Appendix C. Glossary

Term	Meaning
APN	Access Point Name; tells the carrier which data network to connect to
ICCID	SIM card serial number
IMEI	Modem hardware identifier
IMSI	Subscriber identity stored on the SIM
MIMO	Multiple-input multiple-output; the modem uses all four antennas at once for speed and reliability
NSA / SA	5G Non-Standalone (uses an LTE anchor) / Standalone (5G core only)
PLMN	Carrier network code (mobile country + network code)
RSRP	Reference Signal Received Power; signal strength in dBm
RSRQ	Reference Signal Received Quality; signal quality in dB
SINR	Signal to Interference plus Noise Ratio; how clean the signal is, in dB
VRRP	Virtual Router Redundancy Protocol; failover between two routers
WISP	Wireless ISP mode; the router's internet comes from another Wi-Fi network