R5020

High Speed Smart 5G Router

4 x Ethernet + 1 x RS-232 + 1 x RS-485 + 1 x DI + 1 x DO
+ Wi-Fi + GNSS



INTRODUCTION

The R5020 is Robustel's first 5G-capable router supporting global 5G, 4G, and 3G bands. It leverages a proven high-performance CPU platform and RobustOS—a mature and stable operating system developed in-house by Robustel. The R5020 is compliant with 3GPP Release 15 and is designed for the following applications:

—**In-vehicle Applications:** Whether for passenger Wi-Fi, CCTV monitoring, ticketing, or other onboard requirements, the R5020 provides a simple and effective solution to enhance internet speeds and future-proof existing installations. It has achieved E-Mark certification for in-vehicle use and supports GNSS positioning. A version with vehicle ignition sensing is also available to protect vehicle batteries when the engine is off.

—**Broadband Failover:** The R5020 can be configured to use Ethernet or Wi-Fi as the primary internet connection, with automatic failover to 4G/5G in the event of an outage. This provides resilience for establishments such as retail shops and small offices at a reasonable cost, ensuring sufficient bandwidth for multiple users. It supports IPsec, DMVPN, and OpenVPN protocols for secure connections to core networks.

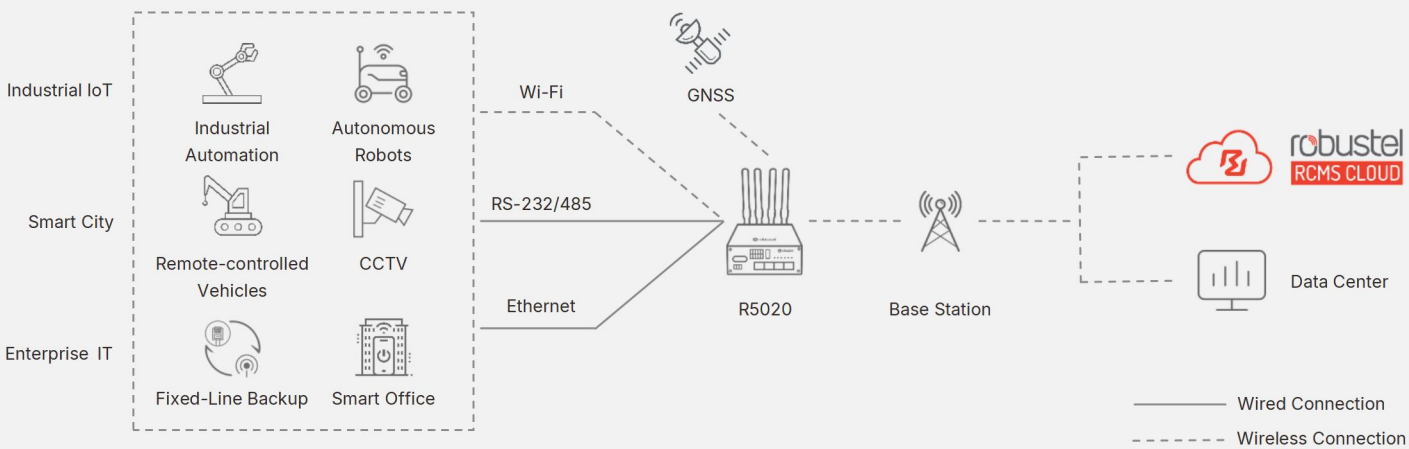
—**Primary Broadband:** Cellular networks now offer unlimited 5G plans at competitive prices, delivering hundreds of Mbps of internet connectivity wirelessly. For many users, the opportunity to eliminate wired connections and utilize a wireless internet solution can be both technically and commercially advantageous.

The **Robustel Cloud Manager Service (RCMS)** is a unified cloud-based platform designed for real-time monitoring and centralized management of industrial IoT devices. Fully compatible with Robustel routers and gateways, RCMS delivers an interactive geospatial dashboard that enables users to visualize device locations and track critical metrics such as data usage, signal strength, and network status. To ensure seamless operations, the platform facilitates over-the-air (OTA) updates for firmware, configurations, and applications, minimizing downtime while optimizing system performance. For more information or to get started with RCMS, visit: https://rcms-cloud.robustel.net

KEY FEATURES

- Global 5G/4G/3G cellular connections
- Supports Ethernet, Wi-Fi and 4G/5G internet with auto-failover
- Cost-effective industrial 5G router solution
- Fully programmable operating system with a well-documented SDK
- Multiple VPN options available including DMVPN & IPsec
- GNSS, ignition sense & E-mark features make the R5020 ideal for vehicles
- Free Robustel Cloud Manager Service platform (RCMS)
- Robust metal enclosure with a compact design for DIN-rail and wall mounting

APPLICATION EXAMPLE



SPECIFICATIONS

Hardware

Hardware System

CPU	Dual-core MIPS, 880 MHz
RAM	512 MB
Flash	32 MB

Cellular Interface

Number of antennas	4 (ANT0 + ANT1 + ANT2 + ANT3)
Connector	SMA-K
SIM	2 x Mini SIM (2FF)

Ethernet Port

Number of ports	4 x 10/100/1000 Mbps, 4 x LAN by default, can be configured as 1 x WAN + 3 x LAN Supports 802.3at PD feature on ETH0
Magnet isolation protection	1.5 kV

Serial Port

Number of ports	1 x RS-232 + 1 x RS-485
Connector	2 x 5-pin 3.5 mm female socket
Baud rate	300–115200 bps
Signal definition	RS-232: TXD, RXD, GND RS-485: Data+ (A), Data- (B), Ground (GND)

Digital Input / Digital Output

Number of ports	1 x DI + 1 x DO, wet contact
Connector	2 x 5-pin 3.5 mm female socket
Isolation	3.75 kVDC (opto-isolator)
Absolute max voltage	+30 VDC (DI), +30 VDC (DO)
Absolute max current	100 mA (DO)
Signal definition	IN, OUT, IGND, OGND

Wi-Fi Interface

Number of antennas	2 (Wi-Fi1 + Wi-Fi2)
Connector	RP-SMA-K
Standards	802.11 a/b/g/n/ac; 2 x 2 MIMO; supports AP and client modes
Frequency bands	2.412–2.472 GHz (2.4 GHz ISM band) 5.15–5.825 GHz (5 GHz ISM band)
Security	WPA, WPA2, WEP, WPA3
Encryption	AES, TKIP

GNSS Interface

Number of antennas	1
Connector	SMA-K
GNSS frequency	GPS: L1, L5 QZSS: L1, L5 Galileo: E1, E5a GLONASS: L1OF BDS: B1

Note: The antenna interface is exclusively compatible with models R5020-5G-A30EU-A and R5020-5G-A30EU-B.

Others

Reset button	1 x RST
USB port	1 x USB 2.0 (host), Type A, 5 V, 500 mA
LED indicators	1 x RUN, 1 x MODEM, 1 x NET, 1 x USR, 1 x RSSI, and 1 x WIFI
Watchdog	Built-in

Power Supply and Consumption

Connector	3-pin 3.5 mm female socket with lock	
Input voltage	PoE-PD version:	12/24 VDC (9–36 VDC in) 42.5–57 VDC (PoE-PD@ETH0)
	ACC version:	12/24 VDC (10–30 VDC in)
	Reverse polarity protection, surge protection	
Power consumption	Idle: 5.5 W@12 V Max: 16 W@12 V	
Rec. power supply	12 VDC/1.5 A power adapter	

Physical Characteristics

Ingress protection	IP30
Housing & Weight	Aluminum, 500 g
Dimensions	48 x 100 x 125 mm
Installation	Desktop, wall mounting & 35 mm DIN rail mounting
Operating temperature	-20 to +55 °C (normal operation) -25 to +70 °C (extended operation)
Storage temperature	-40 to +85 °C
Relative humidity	5–95% RH (non-condensing)

Regulatory and Type Approvals

Environmental	RoHS 2.0, WEEE
EMI	EN 55032 Conducted Emission Class A EN 55032 Radiated Emission Class A
EMS	EN 61000-3-2 (Harmonic Current) EN 61000-3-3 (Voltage Flicker) EN 61000-4-2 (ESD) Contact Level 2, Air Level 3 EN 61000-4-3 (RS) Level 2 EN 61000-4-4 (EFT) Level 3 EN 61000-4-5 (Surge) Level 3, AC Mains Power Port Level 3, Signal Ports EN 61000-4-6 (CS) Level 3 EN 61000-4-11 (Dips) Class 2

Software

Operating System (Basic Features of RobustOS)

Network protocols	PPP, PPPoE, ARP, VLAN, ICMP, NAT, TCP, UDP, DHCP, DNS, DDNS, NTP, HTTP, HTTPS, Telnet, SSH2, SMTP, etc.
VPN tunnels	IPsec, OpenVPN, GRE, WireGuard
Firewalls	DMZ, anti-DoS, Filtering (IP/Domain name/MAC address), Port Mapping, Access Control
Remote management	Web, CLI, SMS, RCMS
Serial port protocols	Transparent, TCP Client/Server, UDP, Modbus RTU to TCP
Others	Smart Roaming V3, etc.

SDK

Operating system	RobustOS (based on Debian Linux)
Programming languages	C, C++
Available Flash for SDK	5 MB
Available RAM for SDK	256 MB

App Center (Available Apps for RobustOS)

Apps*	L2TP, PPTP, DMVPN, VRRP, QoS, SNMP, Language, RCMS, Dynamic Routing, Captive Portal, Modbus Master, TR069*, Edge2Cloud

*Available upon request. For more apps, please visit www.robustel.com.

Cloud Platform

Robustel Cloud Manager Service (RCMS)	RobustLink, RobustVPN, Operation Console

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ORDERING INFORMATION

Model	Order Code	GNSS	PoE-PD	ACC	Frequency Bands	Region	Certifications	Package Contents
R5020-5G-A09GL-B	/	Optional	√	-	5G NR: NSA: n1/2/3/5/7/8/12/20/25/28/38/40/41/48*/66/71/77/78/79 SA: n1/2/3/5/7/8/12/20/25/28/38/40/41/48*/66/71/77/78/79 4G LTE: LTE FDD: B1/2/3/4/5/7/8/12(B17)/13/14/18/19/20/25/26/28/29/30/32/66/71 LTE TDD: B34/38/39/40/41/42/43/48 LAA: B46 3G UMTS: WCDMA: B1/2/3/4/5/6/8/19	Global	CB, CE, UKCA, RCM, FCC, IC, AT&T, PTCRB, POSTEL, NTC, E-Mark	1 x Gateway (B Code: B064802) 4 x Cellular Antenna 2 x Wi-Fi Antenna 1 x Power Adapter 1 x Wall Mounting Kit
R5020-5G-A30EU-A	A006400805	√	-	√	5G NR NSA/SA: n1/3/5/7/8/20/28/38/40/41/71/75/76/77/78 4G: LTE FDD: B1/3/5/7/8/20/28/32/71 LTE TDD: B38/40/41/42/43 3G: WCDMA: B1/5/8	EMEA, APAC	CE, UKCA, RCM, E-Mark	1 x Router (B Code: B006400812) 1 x Wall Mounting Kit
	A006400806	√	-	√		EMEA, APAC	CE, UKCA, RCM, E-Mark	1 x Gateway (B Code: B006400812) 4 x Cellular Antenna 2 x Wi-Fi Antenna 1 x Power Adapter 1 x Wall Mounting Kit
R5020-5G-A30EU-B	A006400807	√	√	-	5G NR NSA/SA: n1/3/5/7/8/20/28/38/40/41/71/75/76/77/78 4G: LTE FDD: B1/3/5/7/8/20/28/32/71 LTE TDD: B38/40/41/42/43 3G: WCDMA: B1/5/8	EMEA, APAC	CE, UKCA, RCM, E-Mark	1 x Router (B Code: B006400813) 1 x Wall Mounting Kit
	A006400808	√	√	-		EMEA, APAC	CE, UKCA, RCM, E-Mark	1 x Gateway (B Code: B006400813) 4 x Cellular Antenna 2 x Wi-Fi Antenna 1 x Power Adapter 1 x Wall Mounting Kit

NOTE:

1. GNSS is optional and requires a 4-in-1 combo antenna.
2. For more information about regional and carrier-specific variants, please contact us.
3. * Denotes certification in progress.

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