INDUSTRIAL CONNECTIVITY / TECHNICAL DATASHEET

CM520-81 Series

Single-port industrial wireless router



Original source photograph



Original source photograph

Source filename revision v3.1; page heading CM520-81F | English review edition | 18 October 2026

REVIEW EDITION - translated from the supplied Chinese document. Source inconsistencies and optional features are retained. See the final review checklist.

Inside this document

Overview and configuration / Functions / Interfaces / Radio specifications / Power and mechanics / Applications / Company profile / Source review notes

Product overview

Source p. 1

The CM520-81 series is an industrial single-port wireless router for data transmission from industrial equipment and Internet access for SMEs and households. The overview lists GPRS, CDMA, EDGE, WCDMA, TD-SCDMA, EVDO and 4G.

An industrial MIPS communication processor and embedded real-time operating system provide protocols from the logical link layer to the application layer. Functions include VPN (PPTP + L2TP + MPPE and IPsec + GRE), IPTABLE firewall, static/dynamic routing, PPP client, DHCP server/client, DDNS, SNAT/DNAT, DMZ, web configuration, APN/VPDN, power-on dialing, link maintenance, scheduled connection/disconnection and power switching.

The source describes WDT and SWP (System Watch Protect), a 3000 V electrical test, proprietary stability technology, strict design/testing and eight years of practical application. These are historical source statements.

Applications include SME/household Internet access, financial/postal transactions, smart grids, transport, environmental/fire/security/water monitoring, public safety, advertising, surveying, industrial control, oilfields/mines, earthquakes, weather, instruments, water/electricity/gas meters, heat networks and centralized meter reading.

Advantages and deployment

Source pp. 1-2

- 5G SA/NSA access; 4G Cat 1 / Cat 4 / Cat 6 options, with stated backward compatibility to 3G/2G. Capability depends on the ordered modem.
- Online-maintenance technology interacts with the base station to maintain connectivity. The source claims reconnection within tens of milliseconds, followed by module restart or a complete device power cycle if needed. This timing is a source claim without test conditions: NEEDS_VERIFICATION.
- Local Wi-Fi and 3G/4G/5G WAN connectivity are described in the advantages; switching between wired and wireless networks provides backup. The detailed radio/interface tables only specify 4G: 5G applicability NEEDS_VERIFICATION.
- Web and SNMP management, remote configuration and upgrades, router OTA and user-application OTA for large deployments.
- Python custom application development; Linux/OpenWrt system development.
- Optional industrial protocols: Modbus TCP, Modbus RTU, EtherNet/IP and Modbus TCP Slave.
- Optional IoT platforms: Alibaba Cloud, Tencent Cloud, power-industry platforms and Amazon AWS; centralized management and batch configuration.
- PPTP, L2TP, IPsec and OpenVPN; TCP/IP, UDP and ICMP; DMZ isolation, virtual IP mapping, MAC-IP binding, WAN access restrictions and user privileges.
- Three-layer system protection adds Virtual Man Watch (VWM) monitoring to software protection and the CPU watchdog timer (WDT). On a network or interference-related exception, the device can perform a full reset, intended to provide recovery without an on-site power cycle.
- High-speed industrial CPU for protocol conversion and recovery from false-online, unresponsive or crashed states.

- The source reports a 3000 V electrical test and lists CE, FCC, RoHS, E-mark, CCC, Mo'er high/low-temperature tests and EMC testing. Certificate identifiers and model-specific scope are not supplied.

Industrial design and reliability

Source pp. 2-3

- Online maintenance, base-station interaction, automatic redial, modem restart and device power-cycle recovery are repeated in the industrial-design list. The source claims reconnection in tens of milliseconds without specifying test conditions.
- Industrial processor, 533 MHz, with 16 KB D-cache and 32 KB I-cache; industrial wireless module.
- Linux 2.6 operating system with MMU and complete TCP/IP stack; industrial PCB following 3H/3W principles and selected components.
- Design-section input: 5-35 V DC, with reverse-polarity, overvoltage and overcurrent protection. The power table says 6-32 V DC: NEEDS_VERIFICATION.
- 1.5 kV Ethernet isolation; shielding, metal enclosure, lightning-protection design and IP30 in the design section.
- Three-layer system protection adds Virtual Man Watch (VWM) monitoring to software protection and the CPU watchdog timer (WDT). On a network or interference-related exception, the device can perform a full reset, intended to provide recovery without an on-site power cycle.
- The 1.8 V / 3 V / 5 V push-type UIM/SIM interface includes 15 kV ESD protection.
- RS232 serial-port protection is stated as 15 kV ESD.
- Metal enclosure with shielding, isolated enclosure/system and lightning-protection design; power-safety requirements. IP41 appears in the reliability text, conflicting with IP30 elsewhere: NEEDS_VERIFICATION.
- The source states that wireless modules have CGD, FCC or CE certification. "CGD" is reproduced as written; the certification name and model-specific scope need verification.
- High-speed protocol processing addresses false-online, unresponsive and crashed states. MMU management is described as preventing memory-related instability.
- The TCP/IP protocol stack is intended to improve communication performance and reduce disconnections.
- The source reports a 3000 V electrical test and favorable EMC/EMI performance, CE certification and EMC testing. It also cites a 2010 customer-satisfaction supplier award. Test conditions, certificates and the award date require source review before publication.
- Flash is printed as 128 Mbit and SDRAM as "1GMbits" in the reliability text; the hardware table states 1 Gbit SDRAM. Packet buffering and a complete TCP/IP stack are described.

Functions and commissioning

Source pp. 3-4

- Cellular WAN with VPN security; wireless video monitoring and moving-image transmission.
- Ethernet communication and routing; serial TCP/UDP transparent transmission or serial configuration.

- VPN protocols and encryption: PPTP, MPPE, L2TP, GRE and IPsec; MPPE40/MPPE128 and stateful MPPE; IPsec DES/3DES/AES/AES128. These are source-listed legacy options, not a recommended security configuration.
- Online detection, connection maintenance, automatic redial and IPTABLES firewall / packet filtering.
- Scheduled online/offline operation and timed power switching.
- Static/dynamic routing; RIPv1, RIPv2, OSPF, BGP, NDSP, IRMP, SNSP, IGMP, DVMRP and PIM-SM/DM, as written. Unusual protocol names NEEDS_VERIFICATION.
- TCP/IP, UDP, ICMP, SMTP, HTTP, POP3, OICQ, Telnet and FTP.
- DHCP/DHCPD; NAT including SNAT/DNAT; DDNS services PeanutHull, 88IP and dyndns; DMZ; APN/VPDN.
- Local/remote web configuration; web configuration backup/restore and batch commissioning; Telnet management with an interactive console shell.
- Dialing with automatically assigned IP, specified IP or specified local/peer IP.
- COM and SYSLOG diagnostics; local serial software upgrades; remote TFTP software upgrades; real-time clock.
- Linux and Windows support is stated without defining device OS versus management-host compatibility. NEEDS_VERIFICATION.
- Factory default settings support quick commissioning with few or no parameter changes, depending on the installation.
- A graphical configuration tool provides quick configuration.
- The product manual provides quick-configuration instructions.
- SYSLOG output supports inspection of operating logs and fault analysis. Serial debugging software provides different diagnostic-output levels to help locate problems.
- The source also states batch graphical configuration and eight years of accumulated product development; this is a source-era statement.

Interfaces and accessories

Source pp. 4, 6



Front interfaces



Side view



Rear interfaces

External interfaces

Parameter	Source specification
Ethernet	1 x 10/100 Base-T LAN1; Ethernet IEEE 802-3 / 802-2 as printed; 1.5 kV isolation.
Serial	1 RS232 or 1 RS485; RS422/TTL also stated as supported configurations. Data bits: 7/8; stop bits: 1/2; parity: none/odd/even/SPACE/MARK; 110-230400 bit/s; no, RTS/CTS hardware or XON/XOFF software flow control.
4G antenna	SMA female, 50 ohm; optional 3/5/10/15 m leads.
UIM	1.8/3/5 V push-type interface; 15 kV ESD protection.
Power	Standard round socket.
RESET	Restore factory defaults.

Accessories

Parameter	Source specification
Illustrated	Power supply, Ethernet cable, serial cable and optional antenna set.

Software specifications

Source pp. 4-6

Network connectivity and IP functions

Parameter	Source specification
Network access	APN / VPDN
Authentication	CHAP / PAP / MS-CHAP / MS-CHAPv2
Radio system	See cellular radio specifications.
LAN protocols	ARP / Ethernet
IP applications	Ping, traceroute, DHCP server/relay/client, DNS relay, DDNS, Telnet, SSH, HTTPS, TFTP, FTP and SFTP.
Routing	Static and dynamic routes.

Security and reliability

Parameter	Source specification
Firewall	Stateful packet inspection (SPI), denial-of-service (DoS) protection, multicast/Ping filtering and access-control lists (ACL).
Address translation	NAT, PAT, DMZ, port mapping and virtual servers.
Users / AAA	User privilege levels; local authentication, RADIUS, TACACS+ and LDAP.
Data security	IPsec VPN, OpenVPN and CA support, including automatic application as stated.
Backup	VRRP, interface backup and optional dual-SIM backup; depends on ordered model.
Link monitoring	Heartbeat checks and automatic reconnection.
Watchdog	Operating self-check and fault self-recovery.

Management and optional integration

Parameter	Source specification
WLAN	Marked optional in the software-table heading; confirm ordered configuration.
Configuration	Local or remote HTTPS, Telnet and SSH.
"Upgrade method" source row	The source actually lists local/remote log output and log retention after power loss. Heading/content mismatch: NEEDS_VERIFICATION.
SMS, optional	Status inquiry, configuration and restart.
On-demand dialing	Data-triggered or SMS-triggered connection; scheduled online/offline operation.
Management	SNMP
Development / platforms, optional	Python custom development; Amazon AWS; Tencent Cloud; power-industry cloud platforms; Alibaba Cloud and other IoT cloud platforms; centralized management and batch configuration.
Industrial protocols, optional	Modbus TCP, Modbus RTU, EtherNet/IP and Modbus TCP Slave.

Cellular and Wi-Fi parameters

Source pp. 6-7

Cellular parameters

Parameter	Source specification
Wireless module	Industrial-grade module.
TDD frequency group	LTE TDD: 2600/2300 MHz; UMTS: 2100/900 MHz; GSM: 850/900/1800/1900 MHz; UMTS Rx diversity: 2100/900 MHz.
FDD frequency group	LTE FDD: 2600/2100/1800/DD800 MHz (DD800 reproduced as printed); UMTS and UMTS Rx diversity: 2100/900 MHz.
Radio schemes	LTE/UMTS/HSPA+/HSDPA/HSUPA/WCDMA/EDGE/GSM
TDD rates	LTE TDD: DL 68 Mbps / UL 17 Mbps; DC-HSPA+: DL 42 Mb/s (Category 24); HSPA+: DL 28 Mb/s (Category 18); HSDPA: DL 14.4 Mb/s (Category 8); HSUPA+: DL 5.76 Mb/s (Category 6), as printed; WCDMA CS: UL/DL 64 kbps; WCDMA PS: UL/DL 384 kbps.
FDD rates	LTE FDD: DL 100 Mbps / UL 50 Mbps; other DC-HSPA+, HSPA+, HSDPA, HSUPA+ and WCDMA values are the same as the TDD table.
Transmit power	LTE: 23 dBm; WCDMA/HSDPA: 24 dBm.
Receiver sensitivity	<-109 dBm
Source-listed module functions	Data, voice, SMS and fax.

Wi-Fi parameters

Parameter	Source specification
Module	Integrated chipset Wi-Fi module, described as highly integrated and stable.
Standards / rates	802.11 b/g/n; 6/9/12/18/24/36/48/54 Mbps; maximum stated 300 Mbps.
Encryption	WEP, WPA and WPA2; source lists 802.11i 4.0, TKIP, AES and CCMP hardware security engines.
Modes	AP and repeater.
Coverage claim	Up to 150 m outdoors without obstructions; conditions are not specified. NEEDS_VERIFICATION.

Hardware, power and mechanics

Source pp. 7-8

Hardware

Parameter	Source specification
CPU	Industrial embedded processor, 533 MHz; MMU.
Flash	128 Mbit, expandable to 256 Mbit.
SDRAM	1 Gbit.

Power

Parameter	Source specification
DC input	6-32 V, with reverse-polarity, overvoltage and overcurrent protection. Design section instead says 5-35 V.
Standard supply	9 V DC / 1.5 A
Communication current	Average 390 mA at +9 V DC; registration peak 1.0 A at +9 V DC.
Standby	Average <56 mA at +9 V DC.

Environment and mechanics

Parameter	Source specification
Operating temperature	-35 to +75 °C
Extended operation	-40 to +80 °C
Storage	-40 to +85 °C
Humidity	95%, non-condensing.
Enclosure	Metal, shielding, isolated enclosure/system, lightning protection; IP30 here, conflicting with IP41 in reliability text.
Body	174 x 131 x 27 mm, excluding antennas and mounting hardware; drawing differs. NEEDS_VERIFICATION.
Package	350 x 215 x 88 mm

Parameter	Source specification
Weight	0.7 kg
Shock / vibration / drop	IEC 60068-2-27 / IEC 60068-2-6 / IEC 60068-2-32

Source-listed EMC parameters

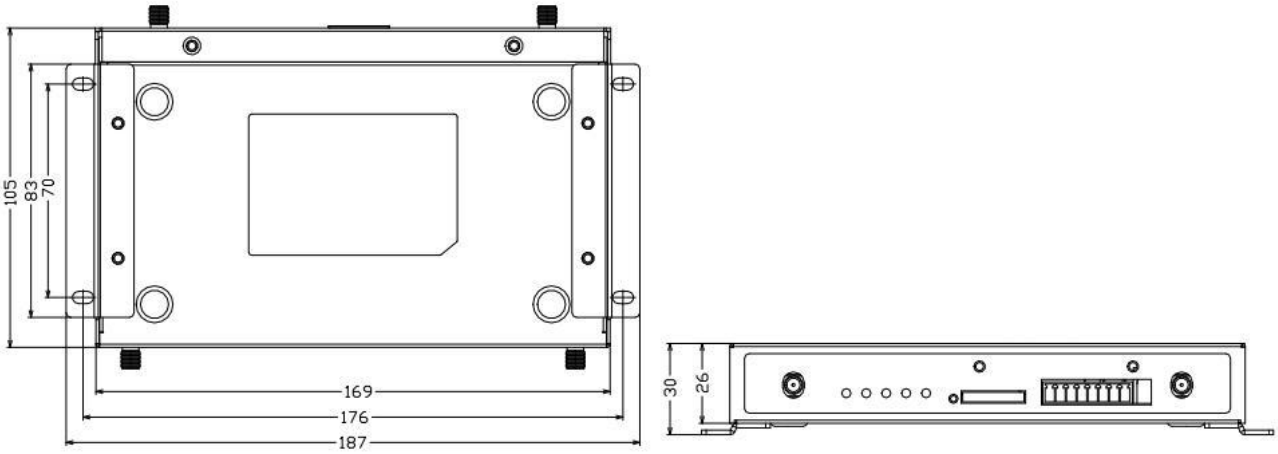
Parameter	Source specification
ESD	EN 61000-4-2, level 3
Radiated electric field	EN 61000-4-3, level 3
Electrical fast transient	EN 61000-4-4, level 3
Surge	EN 61000-4-5, level 3
Conducted disturbances	EN 61000-4-6, level 3
Power-frequency magnetic field	EN 61000-4-8; horizontal/vertical 400 A/m (level 3), as stated. NEEDS_VERIFICATION.

Source-listed product certifications

Parameter	Source specification
Domestic	MIIT network-access permit, CCC, EMC, CRCC railway certification and Mo'er high/low-temperature testing.
International	CE, FCC, E-mark and RoHS.
Verification	These are translated source claims. Certificate identifiers, current validity and exact model scope NEEDS_VERIFICATION.

Installation drawing

Source p. 9



Original manufacturer drawing. Confirm dimensions and product revision against the conflicting body-size table.

Application architectures

Source pp. 10-11

Environmental online monitoring

Parameter	Source specification
Field monitoring stations	VOC detector, camera, vacuum pump, dust/humidity filter, circuit-breaker protection, CAIMORE wireless module, power supply, drying agent, infrared monitoring and flowmeter. Two example monitoring stations are shown.
Communications	Operator cellular network and Internet. The generic illustration labels 4G/5G; it does not establish 5G capability for a product whose detailed radio table lists only 4G.
Services / users	Web service, LED display, environmental monitoring center, mobile app and user-access terminal.

Intelligent transportation architecture

Parameter	Source specification
Platforms	Traffic command/dispatch platform with server/client; traffic signal control/management platform with database, communications services and clients.
Control / publishing	Interactive clients; adaptive-control central services, area services and optimization services; information publishing, server, firewall and public-information service.

Parameter	Source specification
Back end	Servers, communications server, database server and simulated signal equipment.
Field	Operator 4G/5G illustration; CAIMORE CM520 routers and roadside signal/monitoring equipment. Generic image does not verify 5G for the listed 81 hardware.

Company profile and historical recognition

Source p. 12

The following company information is translated from the supplied document and describes the source-era profile. Awards, counts and certifications have not been updated to the present day. English award names are descriptive translations.

Company honors

Year	Recognition stated in source
2011	Named a "Best Supplier for Customer Satisfaction in China's Industrial Control Industry"; the company's GPRS DTU received an "Innovative Product Award".
2012	Became a member of China Quality Long March.
2013	Became a member of the Strategic Alliance for Technological Innovation in the Intelligent Power Transmission and Distribution Equipment Industry.
2014	Recognized as an innovative pilot enterprise. The Zhanjiang Wi-Fi coverage project received a "Model Engineering Project Award" at the 13th China Automation Annual Conference.
2015	Video products were named among the "Top Ten Video Transmission Enterprises" by China Industrial Control and by Huaqiang Security Network. The noise-monitoring project received a "Model Engineering Project Award" at the 14th China Automation Annual Conference.
2016	The video product line was named a "2015-2016 Quality Supplier in China's Security Industry" by Huaqiang Security Network. Charging-pile communication equipment received a "Best Charging Equipment Component Supplier" award.
2016	Received a product gold award at the 7th Guangzhou International New Energy Automobile Industry Exhibition. The organizing committee of the 3rd China Good Wi-Fi event named CAIMORE a "2016 Best Wi-Fi Industry Application Solution Provider".
2018	Industrial routers and DTUs were named among China's top ten brands in their respective categories. Recognized as a key reserve enterprise for public listing in Xiamen.

Year	Recognition stated in source
2019	Recognized as a key reserve enterprise for public listing in Xiamen and Fujian Province. Selected as a DICT solution partner of China Telecom Corporation Limited, Shanghai Branch.
2020	Recognized as a key reserve enterprise for public listing in Xiamen.

Company qualifications

Parameter	Source specification
High-tech enterprise	Recognized nationally as a high-tech enterprise in 2009.
Dual-software enterprise	Recognized nationally as a dual-software enterprise in 2010.
Management systems listed	ISO 9001:2015 quality management; ISO 14001:2015 environmental management; ISO 45001:2018 occupational health and safety management.
Intellectual property	14 patented technologies for device stability and 39 software copyright certificates.
Regional offices	6 regional offices across China, providing nearby customer service.
Registered capital	RMB 20.58 million. The source identifies CAIMORE as a high-tech enterprise supported by Xiamen.
Industry experience	15 years of industry R&D accumulation and application experience, as stated in the source.

Contact information

Parameter	Source specification
Company	Xiamen CAIMORE Communication Technology Co., Ltd.
Address as printed in source	Units 901 and 904, No. 63 Chengyi North Street, Software Park Phase III, Xiamen, China
Telephone / fax	+86-592-5902655 / +86-592-5975885
Website / email	https://www.caimore.com / caimore@caimore.com

Translation and source review notes

Editorial notes; not additional manufacturer specifications

This English review edition follows the supplied Chinese file. Repeated page furniture is consolidated; application diagrams are expressed in English architectures and tables. Manufacturer photographs and numeric drawings retain their original hardware details. Unresolved contradictions are marked NEEDS_VERIFICATION. No missing specification has been invented.

Review checklist

Source / topic	Review note
Model scope	Filename describes CM520-81 series; page headings use CM520-81F. No model-selection table is supplied.
Cellular / optional features	Advantages mention 5G SA/NSA and software optional dual-SIM backup, but detailed interfaces/radio list 4G and do not specify two SIM slots. Confirm exact model before advertising these features.
Power / IP	Design 5-35 V vs power table 6-32 V; reliability IP41 vs physical table IP30. NEEDS_VERIFICATION.
Dimensions / pictured interfaces	Body table says 174 x 131 x 27 mm; original drawing shows a different shape/dimension set. Rear photograph shows multiple RJ45-style sockets but does not identify their roles. Confirm the exact model, port functions and drawing revision rather than inferring an extra Ethernet port.
Protocol names / software heading	NDSP, IRMP, SNSP and the Linux/Windows statement are unclear. Upgrade-method row contains log information, not an upgrade mechanism.
Test / radio claims	Recovery timing, 150 m Wi-Fi range, DD800 and HSUPA+ wording, 400 A/m EMC level and certification scope require review.
Source-era statements	Company office, patent, software-copyright and years-of-experience counts differ among the supplied documents. Each translation preserves its own source counts rather than combining them into a new current company profile.
Certificates and historic awards	Certification and award statements are translations of source material, not independent verification. No certificate numbers were supplied; CGD and Mo'er naming are not expanded into assumed issuing bodies.
Publication status	This English review edition is prepared for technical/editorial review. Resolve the identified source discrepancies before replacing the review status with a public website release.