INDUSTRIAL CONNECTIVITY / ENGLISH TECHNICAL DOCUMENT

CM520-6XX Series

Vehicle cellular and Wi-Fi router - technical specifications



Original source photograph



Original source photograph

Source V1.1 | filename date 20260522 | English review edition | 19 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

Product and configuration / Hardware and radio / Installation and operation (manual) / Source review notes

Product overview

Source p. 1

The CM520-6XX vehicle Wi-Fi router series combines one Gigabit WAN port and four Gigabit LAN ports with 802.11a/b/g/n/ac Wi-Fi and 3G/4G/5G cellular access. Multiple VPN types and wireless authentication connect the WLAN to mobile broadband. The source describes access through China Mobile, China Unicom and China Telecom, according to modem configuration.

The source describes public-hotspot management, advertising portals, web/WeChat/SMS/local authentication, remote device management, Wi-Fi probing, user URL collection and traffic monitoring. Its claim to be the first router compliant with Chinese Ministry of Public Security Order No. 82 is a source claim requiring scope and evidence verification; it does not establish international compliance.

Vehicle-specific features include a dust-resistant design, metal enclosure, mounting plates, interference-resistant circuitry and a vehicle power design intended to tolerate supply fluctuations. Expandable SSD storage is stated up to 2 TB for local multimedia.

An industrial ARM communication processor and embedded operating platform provide PPTP/L2TP/IPsec/OpenVPN, IPTABLE firewall, static routing, static IP/DHCP/PPPoE/cellular WAN, APN/VPDN, Wi-Fi client and switch modes. Primary/backup operation supports wired access as primary and cellular as backup; dual-modem dual dialing and QoS are also described.

Power options include vehicle supply and customized 110 V train power. WDT and System Watch Protect (SWP) are described for autonomous recovery. The source lists CE, RoHS, Mo'er high/low-temperature testing, CCC, telecommunications network access and CRCC certification without certificate identifiers.

Applications include Wi-Fi and multimedia access on buses, coaches, trains and taxis, plus scenic areas and other public venues.

Model selection

Source p. 2

The table distinguishes single- and dual-modem products. GPS / BeiDou and Wi-Fi-band support apply to the specific row, not universally to the entire series. Regional modem bands and options must match the order.

Vehicle router variants

Model	Cellular	Modems	Wi-Fi bands	GPS / BeiDou
CM520-61F	4G	1	2.4 / 5.8 GHz	No
CM520-61FS	5G	1	2.4 / 5.8 GHz	No
CM520-62F	4G	1	2.4 GHz	No
CM520-62FS	5G	1	2.4 GHz	No
CM520-63F	4G	1	5.8 GHz	No

Model	Cellular	Modems	Wi-Fi bands	GPS / BeiDou
CM520-63FS	5G	1	5.8 GHz	No
CM520-64F	4G	1	2.4 / 5.8 GHz	Yes
CM520-64FS	5G	1	2.4 / 5.8 GHz	Yes
CM520-65F	4G	1	2.4 GHz	Yes
CM520-65FS	5G	1	2.4 GHz	Yes
CM520-66F	4G	1	5.8 GHz	Yes
CM520-66FS	5G	1	5.8 GHz	Yes
CM520-67F	4G	2	2.4 / 5.8 GHz	No
CM520-67FS	5G	2	2.4 / 5.8 GHz	No
CM520-68F	4G	2	2.4 / 5.8 GHz	Yes
CM520-68FS	5G	2	2.4 / 5.8 GHz	Yes
CM520-69F	4G	2	2.4 GHz	No
CM520-69FS	5G	2	2.4 GHz	No
CM520-6AF	4G	2	5.8 GHz	No
CM520-6AFS	5G	2	5.8 GHz	No
CM520-6BF	4G	2	2.4 GHz	Yes
CM520-6BFS	5G	2	2.4 GHz	Yes
CM520-6CF	4G	2	5.8 GHz	Yes
CM520-6CFS	5G	2	5.8 GHz	Yes

Advantages and integration

Source pp. 3-4

- Online-maintenance technology exchanges data with the base station, redials after disconnection, restarts the modem and can power-cycle the complete router. The stated reconnection within tens of milliseconds is not accompanied by test conditions.
- Wired/wireless switching; dual-SIM backup; 5G SA/NSA; 4G Cat 1 / Cat 4 / Cat 6 options with 3G/2G fallback as supported by the selected modem.
- Static IP, DHCP client and PPPoE wired WAN; Wi-Fi client; wired-primary/cellular-backup and switch modes. The dual-active mode described here assigns separate LAN subnets to wired and cellular links while also providing link backup.
- VPN clients and servers: PPTP/PPTPD and L2TP/L2TPD; OpenVPN, IPsec and N2N.
- Local firmware updates with configuration-retention choice; SSH shell; serial software upgrades; COM and SYSLOG diagnostics.
- Public Wi-Fi: MAC probing and URL reporting; local, inline and targeted advertising; embedded nginx + PHP + MySQL web service; depot multimedia updates over Wi-Fi with resume support; WiFidog portal with one-click, ordinary, SMS, WeChat and local authentication.
- Remote platform: device status, batch configuration, batch firmware/multimedia updates, authentication-method changes, grouping, traffic control and reporting/analysis.
- Large-scale deployment: web/SNMP management, remote configuration/upgrades, router OTA and user-application OTA. Optional Python applications and Linux/OpenWrt development.
- Optional protocols: Modbus TCP, Modbus RTU, EtherNet/IP and Modbus TCP Slave. Optional platforms: Alibaba Cloud, Tencent Cloud, power-industry cloud and Amazon AWS; centralized management and batch configuration.
- Security: PPTP, L2TP, IPsec, OpenVPN; TCP/IP, UDP and ICMP; DMZ isolation, virtual IP mapping, MAC-IP binding, WAN access limits 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.
- A complete TCP/IP stack and industrial CPU are described for protocol processing and recovery from unresponsive or false-online states. The source reports a 3000 V test and CE/FCC/RoHS/E-mark/CCC, temperature and EMC testing; exact conditions and coverage NEEDS_VERIFICATION.

Industrial design and detailed functions

Source pp. 4-6

- Industrial ARM CPU: main frequency 1.4 GHz (dual core), secondary frequency 733 MHz (dual core), as written. The relationship between the two processors/frequencies is not defined.
- Industrial cellular modules and selected industrial components; PCB design following stated 3H/3W principles; 1.5 kV Ethernet isolation.
- Metal EMI-shielding enclosure, lightning-protected antennas; design section IP30, later reliability section IP31. Both source values are retained pending verification.

- Design-section power: 6-32 V DC with reverse-polarity, overvoltage and overcurrent protection; SIM/UIM 15 kV ESD protection. The later power table says 7-32 V DC.
- Secure vehicle power connector; 1.8/3/5 V push-type SIM interface; RS232 15 kV ESD protection; vehicle I/O fault detection/alarm and GPS location depend on configuration.
- VWM/software/WDT recovery; enclosure/system isolation; modules said to have CGD, FCC or CE certification (CGD is not expanded). MMU; DDR3 4-16 Gbit; large-packet buffering. The source cites a 2010 supplier award, while its honors table dates the similarly named award to 2011.
- APN/VPDN private-network access.
- Ethernet data communication and routing; serial TCP/UDP transparent data transmission or serial configuration.
- Online detection, connection maintenance and automatic redial after disconnection.
- Mutual backup between cellular 4G/5G and wired broadband links, with automatic switching to PPPoE broadband when wireless communication is unavailable, and vice versa.
- Scheduled connection and disconnection; dynamic and static routing; scheduled power on/off.
- TCP/IP, UDP, ICMP, SMTP, HTTP, POP3, OICQ, Telnet and FTP protocols.
- QoS bandwidth management.
- NAT port mapping, including SNAT and DNAT; DMZ host support.
- Dynamic DNS services: PeanutHull, 88IP and dyndns, as listed in the source.
- Local and remote web configuration; local firmware upgrades.
- Extended wireless RTU management-platform protocols.
- Serial local software upgrades; extended wireless RTU platform protocols; source-listed Linux/Windows support does not establish a Windows device OS. SNMP remote management, inline advertising, remote TFTP upgrades and RTC.
- VLAN segmentation; Wi-Fi MAC probing; user URL capture/reporting; local, inline and targeted advertisements; nginx + PHP + MySQL. A standard wired WAN supports PPPoE connections to ADSL and wired broadband.
- 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 general support list includes GSM/GPRS/EDGE, WCDMA/EVDO/TD-SCDMA, LTE TDD/FDD and 5G SA/NSA; actual support depends on module and variant.

Interfaces and accessories

Source pp. 6, 8-9



Front interfaces



Antenna installation view



Rear interfaces

External interfaces

Parameter	Source specification
RS232	1 RS232 port; 7/8 data bits; 1/2 stop bits; none/odd/even/SPACE/MARK parity; 110-230400 bit/s; no flow control, RTS/CTS hardware or XON/XOFF software flow control.
WAN	1 adaptive 10/1000 Mbps WAN port as printed; Auto MDI/MDIX and PPPoE. Introductory text calls this Gigabit.
LAN	4 adaptive 10/1000 Mbps ports as printed; Auto MDI/MDIX; 1.5 kV isolation. The missing 100 Mbps value is not silently inserted.
GPS connector	SMA female, 50 ohm; only on applicable variants.
Indicators	POWER; SYS; link 1 online and signal; link 2 online and signal.
Cellular / Wi-Fi connectors	SMA female, 50 ohm; optional 3/5/10/15 m antenna extension leads.
UIM	Dual interfaces; 1.8/3/5 V push-type; 15 kV ESD protection, as listed.
Power	Vehicle terminal connector.
RESET	Factory-reset button.
TF	1 TF card slot.
USB	1 USB 2.0 host port, 12 Mbps as stated; the source does not claim a 480 Mbps implementation.
I/O	3 channels for vehicle detection/control; NOT standard, requires customization.

Accessories shown

Parameter	Source specification
Power	Power adapter / lead.
Network	Ethernet cable.
Antennas	Optional antennas.

Software specifications

Source pp. 7-8

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 dual-SIM backup.

Parameter	Source specification
Link monitoring	Heartbeat checks and automatic reconnection.
Watchdog	Operating self-check and fault self-recovery.

Optional WLAN

Parameter	Source specification
Standards	IEEE 802.11ac/a/b/g/n
Security	Open system, shared key, WPA/WPA2 authentication; WEP/TKIP/AES encryption.
Modes	AP and client.

Management and optional integration

Parameter	Source specification
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.
DM	Centralized management and batch configuration.
Diagnostics	Ping, traceroute and sniffer packet capture.

Cellular, Wi-Fi and positioning

Source pp. 9-11

Rates are source theoretical figures rather than measured end-to-end throughput. Radio and positioning capabilities vary by ordered module and product configuration.

Cellular radio parameters

Parameter	Source specification
Module	Industrial-grade cellular module.
5G NR SA/NSA bands	n1 / n2 / n3 / n5 / n7 / n8 / n20 / n28 / n41 / n66 / n71 / n77 / n78 / n79
TDD frequency group	LTE TDD: 2600/2300 MHz; UMTS: 2100/900 MHz; GSM: 850/900/1800/1900 MHz; UMTS receive diversity: 2100/900 MHz.
FDD frequency group	LTE FDD: 2600/2100/1800/DD800 MHz, retaining the source DD800 notation; UMTS and receive diversity: 2100/900 MHz.
Radio schemes	NR/LTE/UMTS/HSPA+/HSDPA/HSUPA/WCDMA/EDGE/GSM
5G NR rates	DL 3.4 Gbps / UL 350 Mbps
TDD table 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 table rates	LTE FDD: DL 100 Mbps / UL 50 Mbps; DC-HSPA+, HSPA+, HSDPA, HSUPA+ and WCDMA entries are the same as in the TDD table.
Transmit power	LTE 23 dBm; WCDMA/HSDPA 24 dBm.
Receiver sensitivity	<-109 dBm
Module functions	Data, voice, SMS and fax, as listed; confirm ordered modem and network support.

Wi-Fi radio parameters

Parameter	Source specification
Modules	802.11b/g/n: dual-band 3 x 3 MIMO, 450 Mbps; 802.11ac: dual-band 3 x 3 MIMO, 1.3 Gbps, as described in the source. Exact radio architecture depends on variant.
Frequency	802.11b/g/n: 2.412-2.472 GHz, 13 channels (3 non-overlapping); 802.11a/n: 5.180-5.825 GHz.

Parameter	Source specification
Transmit power	23 dBm for the complete device, as stated.
MTBF	>=20,000 hours
Client capacity	150 simultaneous users on a single band; 254 on dual bands. The separate capacity table says 100 associations per frequency: NEEDS_VERIFICATION.
Security	64/128-bit WEP; WPA-PSK/WPA2-PSK; TKIP and CCMP/AES.
Range	Up to 150 m outdoors in an unobstructed open area, a source claim without test conditions.

GPS / BeiDou parameters

Parameter	Source specification
Module	Industrial GPS / BeiDou module; available according to model.
Receiver	50 channels; L1; 1.023 MHz chip rate and C/A code. SBAS: WAAS, EGNOS, MSAS; stated GALILEO compatibility.
Position accuracy	Position: 2.5 m CPE; SBAS: 2.0 m CPE, exactly as printed. The CPE accuracy abbreviation NEEDS_VERIFICATION.
Velocity / heading accuracy	<0.01 m/s (high speed); <0.01 degree heading (50% at 30 m/s), as stated.
Time accuracy	1 microsecond, synchronized to GPS time.
Acquisition	Cold start: 27 s; assisted start: <3 s; hot start: <1 s.
Data format	NMEA-1083 and SiRD binary, as printed; terminology NEEDS_VERIFICATION.
Input	NMEA / SiRF binary: altitude, position, date and time.
Output	NMEA-0183 / SiRF binary: GGA, GSA, GSV, RMC, VTG, GLL.
Pulse output	1 pps, accuracy +/-1 microsecond.
Navigation update	5 Hz
Sensitivity	Tracking -162 dBm; cold start -147 dBm; hot start -156 dBm.

Hardware, power and capacity

Source pp. 11-12

Hardware

Parameter	Source specification
CPU	Industrial ARM processor; 1.4 GHz (dual core) main frequency and 733 MHz (dual core) secondary frequency, as written.
MMU	CPU memory-management unit.
Flash	512 Mbit NOR Flash.
DDR3	32-bit DDR3, 4-16 Gbit.
TF storage	Expandable up to 512G, as stated.
SSD	Expandable up to 2T, as stated.

Power

Parameter	Source specification
Input	7-32 V DC in the power table; 6-32 V in the design section. NEEDS_VERIFICATION. Reverse-polarity, overvoltage and overcurrent protection.
Standard supply	12 V DC / 2 A.
Communication current	Dual-modem / dual-Wi-Fi reference: average 500 mA at 12 V DC; registration peak 700 mA at 12 V DC.
Standby	Dual-modem / dual-Wi-Fi reference: average <450 mA at 12 V DC.
Other supply systems	110 V train supply, vehicle supply or 220 V adapter supply. The overview marks train supply as customized; do not connect these voltages directly to the low-voltage input.

Table and service capacity

Parameter	Source specification
Table entries	MAC 1000; ARP 1000; routing 256; NAT sessions 20000.
Wireless associations	100 per frequency; separate Wi-Fi table says 150 single-band clients. NEEDS_VERIFICATION.

Parameter	Source specification
Concurrent users	254
Routing throughput	90 Mbps without NAT; 70 Mbps with NAT. These values are not interchangeable with port or cellular link rates.

Environment, mechanics and certifications

Source pp. 12-13

Environment

Parameter	Source specification
Operating	-35 to +75 °C
Extended operating	-40 to +80 °C
Storage	-40 to +85 °C
Relative humidity	95%, non-condensing.

Source-listed EMC parameters

Parameter	Source specification
Electrostatic discharge	EN 61000-4-2, level 3
Radiated electric field	EN 61000-4-3, level 3
Electrical fast transients	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 printed. Test-level consistency NEEDS_VERIFICATION.

Physical characteristics

Parameter	Source specification
Enclosure	Metal; shielding and interference resistance; enclosure/system isolation; lightning-protection design; power-safety requirements; IP30 in the physical table, versus IP31 in the reliability section.
Body	228 mm wide x 35 mm high x 144 mm deep; excludes antennas and mounting hardware.
Weight	1.02 kg
Shock / vibration / drop	IEC 60068-2-27 / IEC 60068-2-6 / IEC 60068-2-32.

Certifications listed

Parameter	Source specification
Domestic	MIIT network-access permit; CCC; EMC; Ministry of Railways CRCC; Mo'er high/low-temperature testing.
International	CE, FCC, E-mark, RoHS.
Scope	Source statements only; certificate identifiers, validity and specific variant coverage NEEDS_VERIFICATION.

Application architectures

Source pp. 13-14

The source illustrations show vehicle connectivity and depot Wi-Fi networks. A router links local vehicle equipment and passenger terminals to the cellular network; a depot Wi-Fi link provides local access and multimedia/resource updates.

Vehicle and depot integration

Parameter	Source specification
Vehicle network	Local wired devices and Wi-Fi terminals connect through the vehicle router to cellular / 5G Internet.
Depot network	Depot Wi-Fi links to the router for resource updates and local network connectivity.
Endpoints	Passenger terminals and vehicle multimedia / monitoring / control equipment, as illustrated. External endpoints and platform software are integration components.

Company profile and historical recognition

Source p. 15

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.
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	Unit 802-7, Building C10, Software Park Phase III, Jimei District, 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

Translated from the supplied Chinese source. Repeated page headers are consolidated. Source-era claims and conflicting values are retained; NEEDS_VERIFICATION identifies unresolved technical issues. Original hardware photographs are retained. Legacy Chinese firmware screenshots are reference images, not a representation of English firmware.

Review checklist

Source / topic	Review note
Source pp. 4-5, 11, 13	Input 6-32 V vs 7-32 V; enclosure IP30 vs IP31. Confirm exact variant and approved limits.
Source pp. 10, 12	150 single-band users vs 100 associations per frequency; routing throughput 90/70 Mbps despite Gigabit ports. Preserve separate test meanings; verify conditions.
Source pp. 8-9	Ethernet table says 10/1000M; USB 2.0 is listed at 12 Mbps. These are retained without assuming omitted or higher speeds.
Source pp. 10-11	GPS CPE accuracy notation, NMEA-1083, SiRD, heading accuracy and secondary CPU frequency require engineering review.
Source pp. 1-3	Order No. 82 compliance and industry-first claims lack supporting scope/evidence. Authentication, probing, URL capture and advertising are source firmware functions, not international compliance claims.
Source pp. 9-11	Bands, voice/fax, TF/SSD and GPS depend on ordered hardware/firmware. Custom I/O and 110 V train supply are not standard.
Source pp. 4, 12-13	3000 V test, CGD acronym, EMC level/400 A/m and certification scopes need supporting evidence.
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.