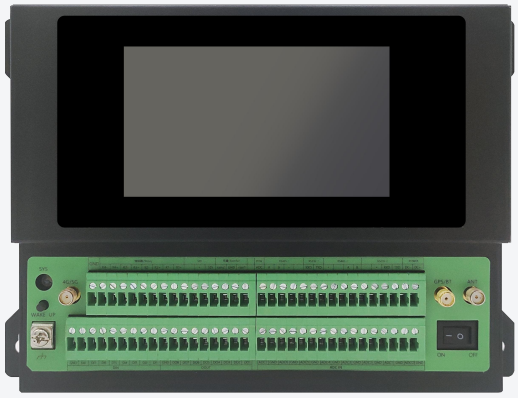
INDUSTRIAL CONNECTIVITY / ENGLISH TECHNICAL DOCUMENT

CM550-21F

Wireless remote monitoring and control terminal



Original source photograph

Source V1.2 | English review edition | 21 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 scope / Technical data / Interfaces and installation / Functions and configuration / Source review notes

Product overview and configuration

Source pp. 1-2

CM550-21F combines data acquisition, remote control and wireless communication in an industrial RTU. It accepts analog sensor/transmitter outputs, logic levels, dry contacts and pulses and integrates Ethernet, serial and cellular transfer.

The listed interfaces are one tipping-bucket rain gauge, two RS232 ports, two RS485 ports, one SDI-12, eight analog inputs, eight digital inputs, eight digital outputs, four relay outputs, one Ethernet and one TF-card interface.

A 4.3-inch TFT touchscreen supports on-site commissioning and parameter configuration.

Model configuration

Model	Connection	Cellular	RS232	RS485	Display
CM550-21F	Ethernet and terminals	2G/3G/4G/5G	2	2	4.3-inch TFT

Acquisition, reporting and management

Source pp. 2-3

- Cellular 2G/3G/4G/5G and Ethernet communication; SMS; external BeiDou and VHF communication equipment can be connected as described. External BeiDou communication is not a specified built-in GNSS receiver.
- Bluetooth app configuration/query and firmware upgrade; TF-card and serial configuration/firmware upgrades.
- 32 MB internal data flash; source claims more than ten years of collected data without a sampling/record-size basis. External 32G TF-card storage is listed.
- Low-power design with self-reporting, polling and compatible modes. One camera connection supports manual, scheduled and alarm-triggered snapshots.
- Reports to eight center stations; automatic primary/backup channel switching. RTC supports manual, remote-center and network synchronization; source clock error is less than one second over two days.
- High/low threshold alarms; extra reports on water-level change and rainfall; rainfall-triggered, scheduled and early-warning acquisition/reporting/storage; equipment-voltage monitoring; manual value entry.
- Remote real-time/history queries, data download and parameter settings; local history export; automatic/manual retransmission and resume after power interruption.
- Center data-processing software provides error correction, redundancy filtering, supplemental reports, message reception/parsing and database storage. Remote diagnosis, configuration, maintenance and program upgrades are listed.
- Online detection, connection maintenance and automatic redial; source lists IPTABLES firewall and packet filtering. Scope on the specified processor/firmware NEEDS_VERIFICATION.
- Factory defaults and common environmental-instrument protocols; GUI and quick-configuration documentation; platform/SMS remote parameters; SYSLOG and serial diagnostic output with selectable debug levels.

- The touchscreen displays local data/status and supports parameter configuration and manual value entry.

Industrial design and recovery

Source pp. 2-3

- Industrial Arm Cortex-M4 MCU at up to 120 MHz in the feature section. The hardware table separately lists an industrial 32-bit processor, 256 KB SRAM and 512 KB program flash.
- High-quality PCB materials; source specifies 3H/3W layout principles, selected industrial components, lightning/EMI design and a metal enclosure with isolation between enclosure and system; source IP30 rating.
- Ethernet 1.5 kV electromagnetic isolation; SIM/UIM and RS232 source-listed 15 kV ESD protection; reverse-polarity, overvoltage and overcurrent protection.
- Software protection, CPU watchdog and Virtual Man Watch (VWM) monitoring can fully reset the system after network or interference exceptions; continuous-online statements are source reliability claims.
- The source also asserts MMU memory management, a 3000 V electrical test and CGD/FCC/CE module approvals. Exact processor features, test evidence and certification scope require verification.

Software, protocols and optional platforms

Source pp. 4-5

Connectivity and reliability

Parameter	Source specification
Network access	APN/VPDN; CHAP/PAP/MS-CHAP/MS-CHAPv2 authentication.
LAN protocols	ARP and Ethernet, as listed.
Link detection	Heartbeat probes, automatic reconnection.
Watchdog	Operating self-check and fault self-recovery.

Optional integrations

Parameter	Source specification
Platforms	Hydrology/water-resource management; environmental monitoring; Alibaba Cloud and other IoT platforms; centralized management and batch configuration.
Protocols	Modbus TCP; Modbus RTU; SZY206 water-resource monitoring data-transfer protocol; SL651; SL/T 427 water-resource monitoring data transfer; HJ212 environmental protocol. Formal editions and supported subsets need confirmation.

Peripheral electrical specifications

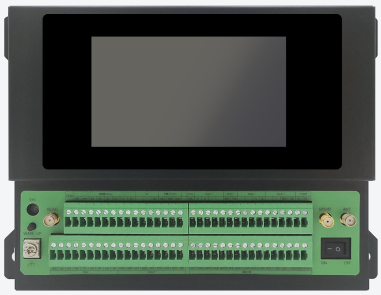
Source pp. 5-6

Ports and signal limits

Parameter	Source specification
Ethernet	One 10/100 Base-T; source IEEE 802-3 / 802-2 notation; 1.5 kV isolation.
Serial	Two RS232 and two RS485; 7/8 data bits; 1/2 stop bits; none/odd/even parity; 300-4000000 bit/s; no, hardware or software flow control.
Rain / SDI / pulse	One tipping-bucket rain gauge; one SDI-12; one pulse count input, up to 1 kHz.
Analog inputs	8 channels; 16-bit ADC; 4-20 mA, optional 0-5 V voltage input.
Digital inputs	8 optoisolated channels. Logic 0: wet contact 0-3 V DC or closed dry contact; logic 1: wet contact 5-30 V DC or open dry contact.
Digital outputs	8 optoisolated channels. Source maxima: 30 V DC switching voltage, 50 mA switching current, 150 mW switching power. Limits are not assumed simultaneously achievable.
Relay outputs	4 optoisolated channels. Source maxima: 250 V AC / 30 V DC, 1 A and 30 W. Confirm the load category and combined ratings before use.
Controlled supplies	5 outputs, listed nominally 12 V / 1 A with overcurrent protection. Pin table also says outputs follow equipment supply voltage; confirm regulation and total/per-output limits.
Antenna	SMA female, 50 ohm; optional 3/5/10/15 m extension cables.
SIM/UIM	1.8/3/5 V flip-type SIM socket with 15 kV ESD protection. Another section calls it a push-type interface; confirm supplied hardware.
Power connector	Industrial terminal with reverse-polarity and overcurrent/overvoltage protection.
Indicator / wake	SYS indicator; button wakes the unit from sleep.

Hardware views

Source p. 4



Front interface, as captioned in source



Side interface, as captioned in source



Rear interface, as captioned in source

Radio specifications

Source pp. 6-7

Source radio parameters

Parameter	Source specification
5G SA/NSA	NR n1/n2/n3/n5/n7/n8/n20/n28/n41/n66/n71/n77/n78/n79.
5G source rates	DL 3.4 Gbit/s / UL 350 Mbit/s; modem capability claim, not measured RTU/application throughput.
Wireless module	Industrial wireless module; actual modem/configuration must be confirmed.
TDD radio group	LTE TDD 2600/2300 MHz; UMTS 2100/900 MHz; GSM 850/900/1800/1900 MHz; receive diversity UMTS 2100/900 MHz.
FDD radio group	LTE FDD 2600/2100/1800/DD800 MHz (source notation retained); UMTS 2100/900 MHz; receive diversity UMTS 2100/900 MHz.
Source encoding/mode list	LTE/UMTS/HSPA+/HSDPA/HSUPA/WCDMA/EDGE/GSM.
TDD-group data rates	LTE TDD DL 68 Mbit/s / UL 17 Mbit/s; DC-HSPA+ DL 42 Mbit/s (category 24); HSPA+ DL 28 Mbit/s (category 18); HSDPA DL 14.4 Mbit/s (category 8); HSUPA+ 5.76 Mbit/s (category 6; source labels DL, direction NEEDS_VERIFICATION); WCDMA CS UL/DL 64 kbit/s; WCDMA PS UL/DL 384 kbit/s.
FDD-group data rates	LTE FDD DL 100 Mbit/s / UL 50 Mbit/s; DC-HSPA+ DL 42 Mbit/s (category 24); HSPA+ DL 28 Mbit/s (category 18); HSDPA DL 14.4 Mbit/s (category 8); HSUPA+ 5.76 Mbit/s (category 6; source labels DL, direction NEEDS_VERIFICATION); WCDMA CS UL/DL 64 kbit/s; WCDMA PS UL/DL 384 kbit/s.

Parameter	Source specification
Transmit power	LTE 23 dBm; WCDMA/HSDPA 24 dBm.
Receive sensitivity	<-109 dBm.
Source-listed services	Data, voice, SMS and fax; verify service support on the ordered modem and regional network.

Processor, power and environment

Source pp. 7-8

Processor and storage

Parameter	Source specification
CPU	Industrial high-performance 32-bit embedded processor. Feature section identifies Cortex-M4, up to 120 MHz.
SRAM / program flash	256 KB / 512 KB.
Data flash	32 MB; expandable to 64 MB.
External storage	32G TF card as listed.

LCD specifications

Parameter	Source specification
Format	24-bit RGB
Resolution	480 x 272
Display size	4.3 inches; 95.0 mm W x 53.9 mm H.
Backlight	LED
LCD operating range	-20 to +70 °C. This is narrower than the listed RTU system range; assembly operating limits NEEDS_VERIFICATION.

Supply and operating limits

Parameter	Source specification
Input	7-32 V DC in design/specification; another reliability paragraph says 5-36 V. NEEDS_VERIFICATION.
Adapter	9 V DC / 1.33 A
Communication current	400 mA at 9 V DC
Registration peak	1.0 A at 9 V DC
Standby	<200 mA at 9 V DC
Operating	-35 to +75 °C
Storage	-40 to +85 °C
Humidity	95% RH, non-condensing.

Source EMC indicators

Parameter	Source specification
ESD	EN 61000-4-2, level 3
Radiated field	EN 61000-4-3, level 3
Electrical fast transient	EN 61000-4-4, level 3
Surge	EN 61000-4-5, level 3
Conducted disturbance	EN 61000-4-6, level 3
Power-frequency magnetic field	EN 61000-4-8; horizontal/vertical 400 A/m, labeled level 3 in source. Confirm test level/report.

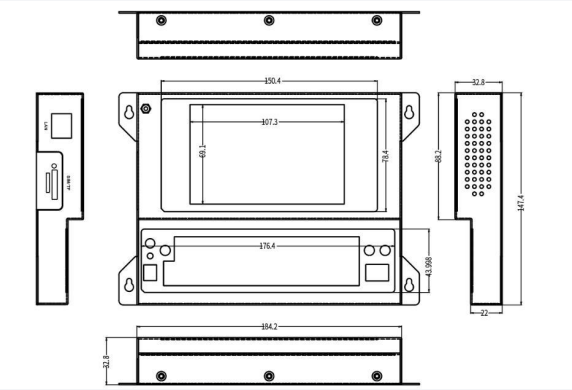
Mechanics and test references

Parameter	Source specification
Enclosure	Metal, shielding, lightning design, enclosure/system isolation, source IP30.
Dimensions	210 x 147.4 x 32.8 mm excluding antenna; source refers other products to appendices.

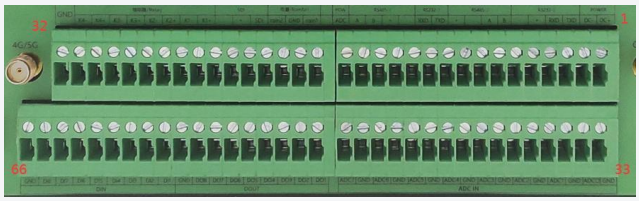
Parameter	Source specification
Weight	Approx. 900 g excluding antennas, mounting parts and packaging.
Shock / vibration / drop	IEC 60068-2-27 / IEC 60068-2-6 / IEC 60068-2-32.
Domestic claims	MIIT network access permit, 3C, EMC, Ministry of Railways CRCC and Mo'er high-/low-temperature testing.
Overseas claims	CE, FCC, E-mark and RoHS. No certificate numbers or exact variant scope supplied.

Installation and terminal orientation

Source p. 9



Original source dimensional drawing; use numeric labels and confirm revision.



Original terminal-numbering reference

Terminal definitions 1-66

Source pp. 10-11

Controlled supply rows state that output voltage follows equipment input, default 12 V DC with 1 A rated current. This conflicts with the separate fixed 12 V wording and 9 V adapter. Confirm actual output behavior and grounding before integration. Pin order and polarity below follow the source; no wiring has been tested.

Complete terminal schedule

Pin	Signal	Source function
1 / 2	DC+ / DC-	Supply input positive / negative.
3 / 4	RS232-2 TXD / RXD	Second RS232 transmit / receive; default 115200 bit/s.
5 / 6	+ / -	Controlled supply for RS232-2.
7 / 8	RS485-2 B / A	Second RS485 B / A; default 115200 bit/s.
9 / 10	- / +	Controlled supply for RS485-2; note polarity order.
11 / 12	RS232-1 TXD / RXD	First RS232 transmit / receive; default 115200 bit/s.

Pin	Signal	Source function
13 / 14	- / +	Controlled supply for RS485-1; note polarity order.
15 / 16	RS485-1 B / A	First RS485 B / A; default 115200 bit/s.
17	ADC_POWER / ADC	Controlled positive supply for analog-input equipment.
18	Rain1	Pulse count.
19	GND	Digital-input ground.
20	Rain2	Rain-gauge input.
21	SDI	SDI-12 data.
22 / 23	+ / -	Controlled supply for SDI-12.
24 / 25	K1+ / K1-	Relay 1 output pair.
26 / 27	K2+ / K2-	Relay 2 output pair.
28 / 29	K3+ / K3-	Relay 3 output pair.
30 / 31	K4+ / K4-	Relay 4 output pair.
32	GND	Spare supply-input negative.
33 / 34	GND / ADC0	Analog-input ground / channel 0; 4-20 mA in this pin table.
35 / 36	GND / ADC1	Analog-input ground / channel 1; 4-20 mA in this pin table.
37 / 38	GND / ADC2	Analog-input ground / channel 2; 4-20 mA in this pin table.
39 / 40	GND / ADC3	Analog-input ground / channel 3; 4-20 mA in this pin table.
41 / 42	GND / ADC4	Analog-input ground / channel 4; 4-20 mA in this pin table.
43 / 44	GND / ADC5	Analog-input ground / channel 5; 4-20 mA in this pin table.

Pin	Signal	Source function
45 / 46	GND / ADC6	Analog-input ground / channel 6; 4-20 mA in this pin table.
47 / 48	GND / ADC7	Analog-input ground / channel 7; 4-20 mA in this pin table.
49	DO1	Digital output channel 1.
50	DO2	Digital output channel 2.
51	DO3	Digital output channel 3.
52	DO4	Digital output channel 4.
53	DO5	Digital output channel 5.
54	DO6	Digital output channel 6.
55	DO7	Digital output channel 7.
56	DO8	Digital output channel 8.
57	GND	Digital-output ground.
58	DIN1	Digital input channel 1.
59	DIN2	Digital input channel 2.
60	DIN3	Digital input channel 3.
61	DIN4	Digital input channel 4.
62	DIN5	Digital input channel 5.
63	DIN6	Digital input channel 6.
64	DIN7	Digital input channel 7.
65	DIN8	Digital input channel 8.
66	GND	Source calls this digital-output ground in the DIN group. Ground role NEEDS_VERIFICATION before wiring.

Applications and monitoring architecture

Source pp. 1, 12-13

Application scope

Parameter	Source specification
Hydrological variables	Tide/water level, flow velocity, water quality/temperature, rainfall, wind speed/direction; acquisition, storage, display, control, alarms and transfer. Display hardware is model-dependent.
Smart-city monitoring	Urban flooding/standing water, sewage quality, urban pipelines, rainfall stations and pressure points.
Water conservancy	Rain gauges; river/reservoir rainfall and water levels; gauging stations; irrigation districts and open channels.
Water utilities	Waterworks automation; online water quality; supply networks; major water users; secondary water supply.
Geological hazards	Collapse and landslide sites; debris flows; surface/deep displacement; soil moisture; ground sound; pore-water/seepage pressure; rainfall and surface-water level.

Source monitoring diagrams

Parameter	Source specification
Rain / water / flow / water quality	Sensors and meters connect to the RTU through analog/serial interfaces; cellular/network links send data to monitoring-center applications.
Water-resource IoT	Multiple field RTUs acquire and transfer instrumentation data through LAN/APN/Internet architecture to server platforms, remote monitoring workstations and mobile clients. External sensors, cameras, servers and platforms are integration components.

Company profile and historical recognition

Source p. 14

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.

Parameter	Source specification
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 review

English translation of the supplied Chinese technical document. Repeated page furniture and repeated feature statements are consolidated. Original hardware photographs and drawings are preserved. NEEDS_VERIFICATION identifies missing or inconsistent source data. No device testing, certificate validation or website publication has been performed.

Review checklist

Topic	Review note
Supply and output ratings	7-32 V vs 5-36 V input; 9 V adapter vs controlled outputs described as default 12 V and tracking input. Digital-output and relay maxima need combined-rating confirmation.
Processor / software	Cortex-M4 features are mixed with generic MMU, IPTABLES and other platform claims; confirm exact hardware/firmware support. Ten-year storage lacks a sampling/record basis.
Ground / interface wording	Terminal 66 is in the DIN group but called digital-output ground. SIM type differs between paragraphs. Confirm signal grounds, isolation and actual ports.
Display	LCD -20 to +70 °C versus system -35 to +75 °C; final assembly limits need confirmation.
Radio / certificates	NR and radio peak rates require modem/region confirmation; do not equate module rates with RTU throughput or use source-listed certification names as validated certificates.
Source claims	Performance, certifications, reliability and historical company statements describe the supplied source; they are not independent test results or current certification evidence.
Publication status	English review edition; technical discrepancies require manufacturer approval before a public release.