INDUSTRIAL CONNECTIVITY / ENGLISH TECHNICAL DOCUMENT

CM580-59F / RK3399

RK3399 platform software and hardware user manual



Original source photograph

Source V1.0 | 26 June 2020 | 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

Source-era support and document information

Source pp. 1-3

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Recommended/default settings are not necessarily appropriate for a project. Check every factory parameter on receipt and adjust settings for the application. The source disclaims responsibility for problems caused by incorrect configuration and communication faults caused by virus attacks.

Source contacts and copyright

Parameter	Source specification
Company	Xiamen CAIMORE Communication Technology Co., Ltd.
Support address	Room 302, No. 23-1 Wanghai Road, Software Park Phase II, Xiamen, China.
Page-footer address	2nd floor, No. 37 Wanghai Road, Software Park Phase II, Xiamen, China. Source addresses differ and are historical.
General phone / fax	+86-592-5902655 / +86-592-5975885
Support phone / email	+86-592-5901883 / support@caimore.com
Website / general email	http://www.caimore.com / caimore@caimore.com
Postal code / copyright	361009 / 2003-2020
Source slogan	CAIMORE Communication - Connecting the World (descriptive translation).

Revision and safety

Source pp. 2-3

- Read these safety instructions carefully and retain this manual for future reference.
- Disconnect the power cord before cleaning with a damp cloth. Do not use liquid detergents or spray cleaners.
- For cord-powered equipment, provide an easily accessible nearby power outlet. Do not use the device in a damp environment.
- Check that the outlet voltage meets the equipment requirements before connecting power. Route the power cord to prevent tripping and do not place objects on it.

- Do not open the device yourself; use a qualified/certified engineer. Do not store it outside the recommended storage-temperature range.
- Install horizontally or on a wall; avoid severe vibration and do not stack other equipment on the device.
- Use the original shock-protective packaging and carton when transporting the unit where possible.
- Disconnect power during long periods of non-use to avoid damage from excessive voltage fluctuations.

Source revision

Version	Change	Date	Author
V1.0	Initial official release	2020-06-26	LJH

Product scope and platform

Source pp. 5-6

This manual describes the CAIMORE 3399 platform artificial-intelligence software on CM580-59F. The source provides platform, hardware and configuration information, rather than measured AI inference performance.

- 3D, VR, face recognition and signage; industrial control/acquisition; POS and vehicle control; unattended terminals; security/monitoring/policing/IoT; human-machine interaction and intelligent retail.
- Rockchip RK3399 big.LITTLE architecture: two Cortex-A72 and four Cortex-A53 cores, with independent NEON coprocessor support; up to 2 GHz.
- Quad-core ARM Mali-T860 graphics; source-listed smart overlay, ASTC and local pixel storage/bandwidth compression technologies.
- The source claims 4K VP9 and 4K 10-bit H.265/H.264 decoding up to 60 fps, 4K x 2K 60 fps H.264/H.265/VP9 and 1080p 30 fps H.264/MVC/VP8; JPEG and image pre-/post-processing.
- Source platform expansion includes UART, LVDS, audio, USB, Type-C, Gigabit Ethernet, TF, GPIO, I2C, SPI, I2S and HDMI. An expansion list does not establish that every platform signal is exposed on the delivered product.
- The expansion list in this manual includes PCIe storage and MIPI; exact fitted interfaces remain dependent on board revision.

Source hardware specifications

Source pp. 6-7

System, interfaces and power

Parameter	Source specification
OS	Android 7.1.2
CPU	RK3399: 2 x Cortex-A72 + 4 x Cortex-A53; up to 2 GHz.
RAM	Default 4 GB; 2/4 GB options.
Storage	On-board eMMC default 16 GB; 8/16/32 GB options.
TF storage	8/16/32/64/128 GB cards listed.
HDMI / LVDS	HDMI 1080p60 and 4K x 2K60; dual LVDS 1080p at 50/60 Hz.
Graphics APIs	OpenGL ES 1.1/2.0/3.0/3.1; OpenVG 1.1; OpenCL; DX11.
Video	4K VP9 and 4K 10-bit H.265/H.264 decode up to 60 fps; 1080p VC-1/MPEG-1/2/4/VP8 decode; 1080p H.264/VP8 encode.
Indicators / keys	Power, Wi-Fi and 4G; factory-restore key. Later panel legend instead says system LED and includes Back.
USB	6 USB 2.0; 1 USB 3.0; 1 Type-C.
Audio	Shared 3.5 mm headphone/microphone; 4-ohm 1 W external speaker on 2-pin connector.
Serial	Specification table: 4 RS232 and 1 RS485; panel/appendix: three operational RS232, RS232 debug and 2 RS485.
SIM	Push-type SIM row also says dual-SIM single-standby. Panel shows dual SIM.
Positioning	Built-in GPS/BeiDou dual-mode module.
Cellular	Optional Mini PCIe 3G/4G module.
Wi-Fi / Bluetooth	Dual-band 5 GHz/2.4 GHz Wi-Fi, hotspot, 802.11 b/g/n; Bluetooth 4.0, as printed.
Ethernet	1 x 10/100/1000 Mbit/s
Supply	9-28 V DC; reverse-polarity, overvoltage/overcurrent protection; 12 V / 3 A adapter.

Parameter	Source specification
Standby current	330 mA at 9 V; 250 mA at 12 V; 125 mA at 24 V.
Maximum working current	660 mA at 9 V; 500 mA at 12 V; 250 mA at 24 V.
Dimensions	188.4 x 131.4 x 35 mm
Operating / humidity	-25 to +70 °C; 95% RH, non-condensing.

Industrial design

Parameter	Source specification
Hardware	Source claims vibration resistance, dust resistance and low heat for industrial environments.
PCB	20H/3W layout principles and Shengyi PCB materials.
Components	Selected industrial components.
Enclosure / EMC	Metal shielding enclosure, source IP41 rating and antenna lightning-protection design; confirm actual enclosure and certification scope.

Product and panel views

Source pp. 8, 10-12



Original source product photograph



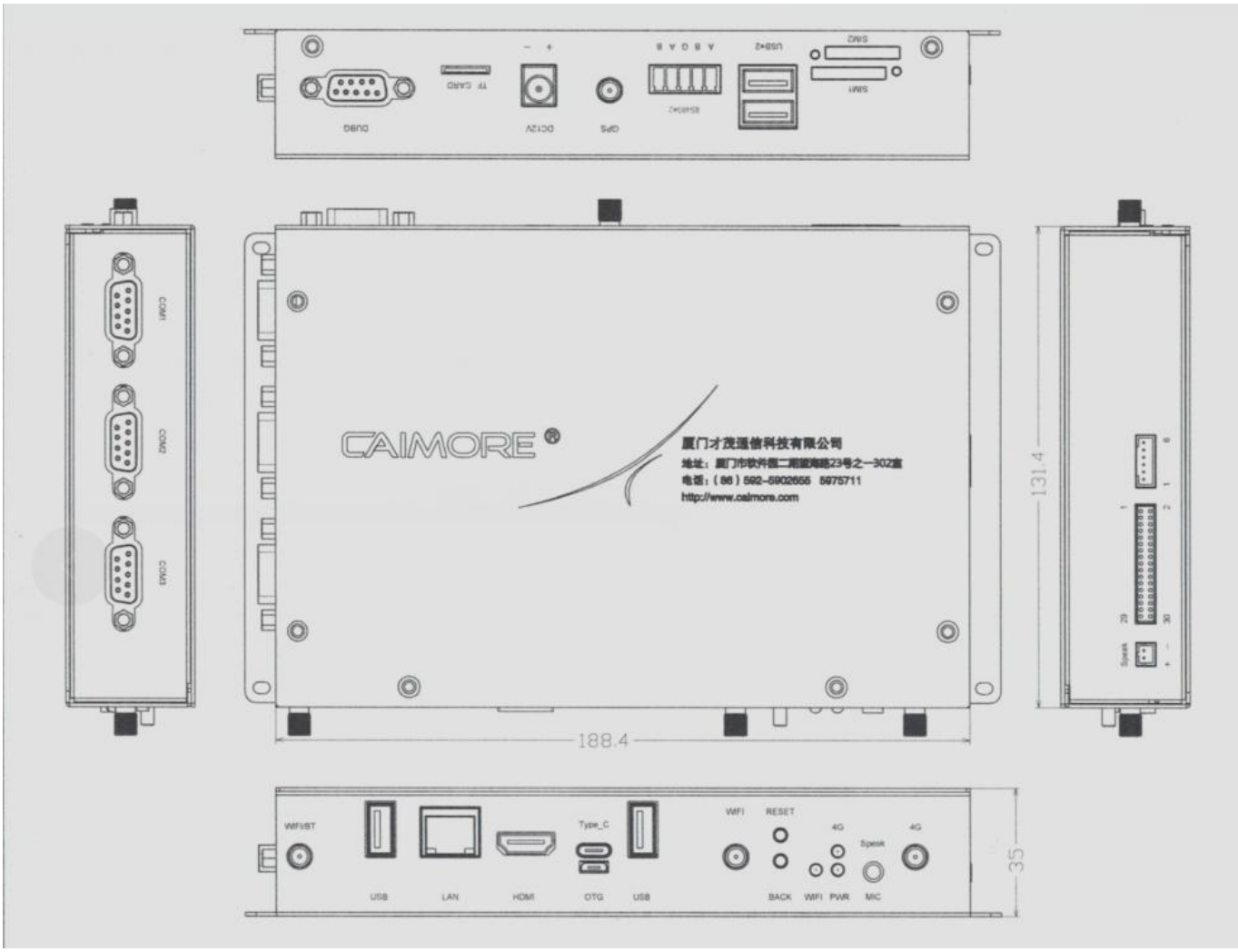
Original labelled front reference



Original rear connector reference

Installation drawing

Source p. 9



Original source dimensions, mm

Panel connector legend

Source pp. 11-12

Source labels A-X

Parameter	Source specification
A / B / C / D	Wi-Fi/BT SMA female / USB-A with 500 mA short-circuit protection / Gigabit RJ45 / HDMI.
E	Type-C and micro USB OTG; cannot be used simultaneously.

Parameter	Source specification
F / G	USB-A 500 mA short-circuit protected / dual-band Wi-Fi SMA female antenna.
H / I / J / K	Factory restore and Back / power+system+4G LEDs / shared 3.5 mm headphone-MIC / cellular antenna.
L / M / N	Three asynchronous RS232 DB9 male connectors.
O / P / Q	2-pin 2.0 mm 1 W speaker / 30-pin 24-bit dual-channel 8-bit LVDS / 6-pin backlight.
R / S / T	Dual SIM, single standby / stacked USB-A / two RS485 channels.
U / V / W / X	GPS / DC12 power / TF / RS232 DB9 debug (source DUBG typo).

Unpacking and accessories

Source p. 13

Retain all accessories. The source packing list includes the following.

Packing list

Item	Quantity / status
Industrial computer	1
Cellular SMA-male antenna	1
Dual-band Wi-Fi SMA-male antennas	2
GPS SMA-male antenna	1
12 V / 3 A switching supply	1
RJ45 Ethernet cable	1
RS232 cables	4, optional
Type-C cable	1, optional
Disc / certificate	1 disc; product conformity certificate.

Connector pin definitions

Source pp. 13-16

Pin numbering and orientation follow the source diagrams. Confirm the actual board revision and connector supply before wiring.

DB9 RS232 source pinout

Pin	Source signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

RS485 source pinout

Pin	Source signal
1	B
2	A
3	GND
4	B
5	A

Speaker source pinout

Pin	Source signal
1	Speaker -
2	Speaker +

BLK backlight 6-pin

Pin	Source signal
1	+12VDC
2	+12VDC
3	LCDBKL_EN
4	LCDPWM
5	GND
6	GND

LVDS 30-pin

Pin	Source signal
1	VCC
2	VCC
3	VCC
4	GND
5	GND
6	GND
7	LVDS0_TX0_NEG
8	LVDS0_TX0_POS
9	LVDS0_TX1_NEG

Pin	Source signal
10	LVDS0_TX1_POS
11	LVDS0_TX2_NEG
12	LVDS0_TX2_POS
13	GND
14	GND
15	LVDS0_CLK_NEG
16	LVDS0_CLK_POS
17	LVDS0_TX3_NEG
18	LVDS0_TX3_POS
19	LVDS1_TX0_NEG
20	LVDS1_TX0_POS
21	LVDS1_TX1_NEG
22	LVDS1_TX1_POS
23	LVDS1_TX2_NEG
24	LVDS1_TX2_POS
25	GND
26	GND
27	LVDS1_CLK_NEG
28	LVDS1_CLK_POS
29	LVDS1_TX3_NEG
30	LVDS1_TX3_POS

USB 2.0 4-pin

Pin	Source signal
1	VCC+ (5V)
2	D-
3	D+
4	GND

System installation

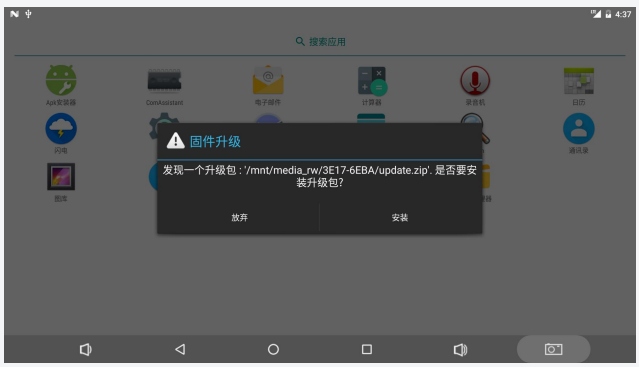
Source p. 16

- 1. Connect an HDMI or LVDS display.
- 2. Connect the keyboard and mouse to USB ports.
- 3. Connect the supplied 12 V / 3 A adapter output to the computer power input to start the device.

USB / TF update while Android is running

Source pp. 17-18

- 1. Rename the approved upgrade package update.zip and place it in the USB drive or TF card root directory.
- 2. Insert the storage while Android is running. After approximately five seconds, the firmware-upgrade confirmation appears.
- 3. Select Install. Keep the USB cable or charger connected and do not remove the USB drive/TF card.
- 4. The system enters upgrade mode. Do not interrupt power.
- 5. After a successful upgrade, the system restarts automatically.



Original upgrade prompt; English action: Install



Original installation progress reference

Storage-card firmware recovery

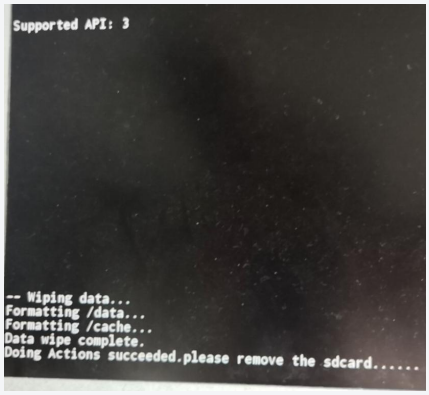
Source pp. 19-21

WARNING FROM SOURCE: this method erases all data on the device. This translation documents the procedure; no flashing tool has been executed. The illustrated firmware filename names CM580-52F, not CM580-59F; use only a manufacturer-confirmed image for the exact device.

- 1. Extract SD_Firmware_Tool._v1.46.rar and launch SD_Firmware_Tool.exe.
- 2. Connect the removable storage to the PC and select the correct recognized storage in Step 1: Select removable disk.
- 3. In Step 2: Select function mode, leave Firmware Upgrade selected as in the source.
- 4. In Step 3: Select upgrade firmware, choose the approved firmware image. Source example: android_arm64-userdebug-7.1.2-CM580-52F-20190613-093754.img; this is an unverified, model-mismatched example, not a recommendation.
- 5. In Step 4: Select demo data, select Start creating and wait for completion.
- 6. Insert the prepared storage into the device and power-cycle as instructed by the source; upgrade progress appears.
- 7. Wait for the completion screen.
- 8. Remove the storage card when the successful completion message instructs removal.



Original card-creation tool; English steps are listed above



Original success message; remove the card after successful creation/update as instructed

Appendix: device nodes and serial mapping

Source p. 22

Source serial mapping

Silkscreen	Symlinks	Real node	Flow control	Source pin labels
COM1 / RS232	ttyS1 / ttyO1	ttyR1	No	2 COM1_RXD; 3 COM1_TXD; 5 GND
COM2 / RS232	ttyS2 / ttyO2	ttyR2	No	2 COM2_RXD; 3 COM2_TXD; 5 GND
COM3 / RS232	ttyS3 / ttyO3	ttyR0	No	2 COM3_RXD; 3 COM3_TXD; 5 GND
COM4 / RS485	ttyS4 / ttyO4	ttyXRUSB0	No	1 COM4_B; 2 COM4_A; 3 GND; 4 COM4_B; 5 COM4_A
COM5 / RS485	ttyS5 / ttyO5	ttyXRUSB1	No	1 COM4_B; 2 COM4_A; 3 GND; 4 COM4_B; 5 COM4_A (source labels)

Software configuration: networking

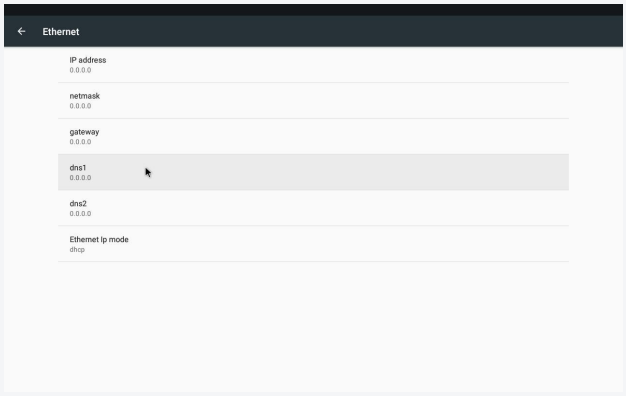
Source pp. 22-24

Open the source Android networking settings. The screenshots show USB tethering, portable WLAN hotspot, WLAN hotspot configuration, Bluetooth tethering and 4G routing sharing. The WLAN dialog includes network name, security (WPA2 PSK), password (at least 8 characters), Show password, AP band (2.4 GHz shown), Cancel and Save. Values in screenshots are examples, not deployment defaults.

The Ethernet screen includes IP address, netmask, gateway, DNS1, DNS2 and Ethernet IP mode (dhcp shown). Configure these to match the actual network; the displayed 0.0.0.0 values do not establish usable static settings.



Original WLAN hotspot configuration screenshot



Original Ethernet configuration screenshot

Software configuration: display and sleep

Source pp. 24-26

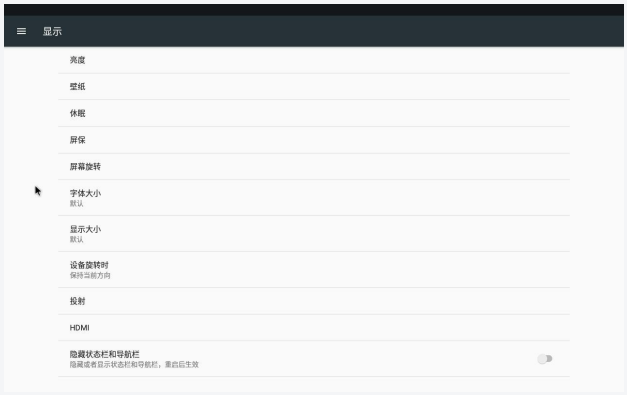
Display settings include brightness, wallpaper, sleep, screensaver, rotation, font size, display size, device rotation, buttons and HDMI. The source instructs using the switch next to Hide status bar and navigation bar for dynamic visibility; the screenshot additionally says the change takes effect after restart. This discrepancy requires firmware confirmation.

To set the source default to never sleep, the manual shows the following Android source file and resource value. This is a build-time configuration example, not an instruction that was executed on the user device.

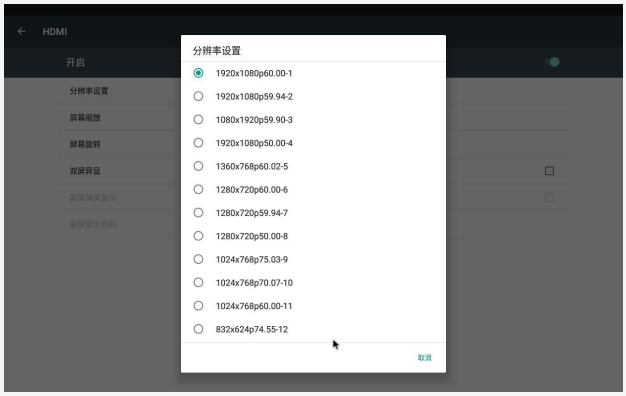
frameworks/base/packages/SettingsProvider/res/values/defaults.xml

<integer name="def_screen_off_timeout">-1</integer>

HDMI settings provide Enable, resolution, screen scaling, rotation, independent dual display, secondary-display application and secondary-display direction. Set the resolution supported by the attached display; the screenshot list is reproduced in the table. The dual-display page shows an independent-display checkbox; the source does not supply an application API or a further procedure.



Original display settings screenshot



Original HDMI resolution screenshot

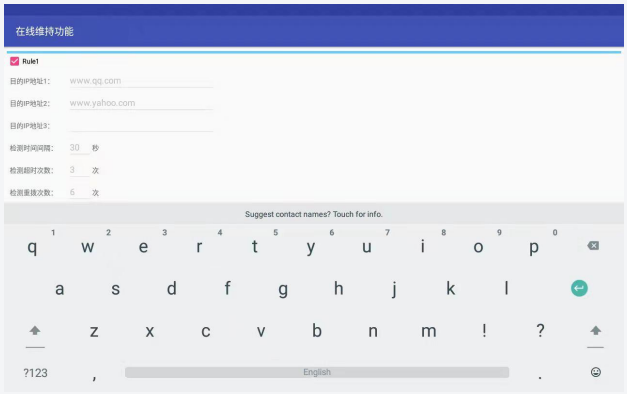
HDMI resolution examples in screenshot

Source mode label
1920x1080p60.00-1
1920x1080p59.94-2
1080x1920p59.93-3
1920x1080p50.00-4
1360x768p60.02-5
1280x720p60.00-6
1280x720p59.94-7
1280x720p50.00-8
1024x768p75.03-9
1024x768p70.07-10
1024x768p60.00-11
832x624p74.55-12

Software configuration: online maintenance

Source pp. 26-27

The Online Maintenance screen shows Rule1 enabled, three destination fields, a detection interval and timeout/redial counts. Source screenshot examples are translated below. These addresses and counts are examples; their current reachability and exact failure-handling behavior were not tested.



Original online-maintenance configuration screenshot

Visible fields and example values

Parameter	Source specification
Rule1	Enable checkbox.
Destination IP/address 1	www.qq.com
Destination IP/address 2	www.yahoo.com
Destination IP/address 3	Blank in screenshot.
Detection interval	30 seconds
Detection timeout count	3 times
Detection redial count	6 times

Translation and source review notes

Editorial review

English translation of the supplied Chinese document. Repeated headings, page furniture and repeated feature text are consolidated. Original hardware figures and screenshots are retained with English explanations. NEEDS_VERIFICATION identifies inconsistent or incomplete source information. No hardware, firmware, electrical, codec, certification or compatibility testing has been performed.

Review checklist

Topic	Review note
Hardware revision	This manual and the separate 59F datasheet disagree on memory/storage, input, temperatures, audio, Wi-Fi and RS485 count. Preserve them as separate revision-specific documents.
Firmware example	Recovery erases all data; example image names CM580-52F. Confirm correct image/tool/version before actual use. No flashing was performed.
Serial / UI	COM5 pin labels repeat COM4; 1 versus 2 RS485, three user RS232 plus debug, and dynamic-hide versus restart-effective wording need firmware confirmation.
AI and legacy support	No AI model, benchmark, NPU specification or measured accuracy is supplied. Android/API/driver, online-maintenance defaults and current software availability remain unverified.
Publication	English review edition; not uploaded. Confirm unresolved specifications before issuing a public datasheet.
Source claims	Historical company information, certifications and performance statements are translated as source claims, not independently verified results.