INDUSTRIAL CONNECTIVITY / ENGLISH TECHNICAL DOCUMENT

CAIMORE 2G / 3G / 4G DTU

Installation, configuration and protocol manual



Original source photograph

Source V5.2 | 2020-09-08 | 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

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

Notices and source revision history

Source pp. 1-6

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This English edition consolidates repeated steps and page headers. Commands, message formats and model limits are retained. Original Chinese tool screens remain reference images; they do not imply English firmware or current software availability. Example addresses and phone numbers are source examples, not deployment settings.

Source contact information

Parameter	Source specification
Company	Xiamen CAIMORE Communication Technology Co., Ltd.
Main address	Units 901 and 904, No. 63 Chengyi North Street, Software Park Phase III, Xiamen, China; postal code 361009.
Main telephone / fax	+86-592-5902655 / +86-592-5975885
Support address	Rooms 901/904, Building B20, Software Park Phase III, Xiamen, as printed.
Support	+86-592-5908952 / +86-592-5908953; support@caimore.com
Website / general email	www.caimore.com / caimore@caimore.com

Source revisions

Version	Change	Date	Author / approval
V4.0	Third official release	2014-05-13	Huangjh
V4.1	Protocol parameter instructions	2014-05-19	Huangjh / Lifw
V4.2	Corrections	2014-06-27	Lifw
V4.3	Removed DIN-rail installation	2014-08-07	Lifw

Version	Change	Date	Author / approval
V4.4	Models and interfaces	2014-08-08	Lifw
V4.6	Tool model list and expired content	2014-09-04	Lixw / Lifw
V4.7	3160 Flash-protection disabling	2014-09-17	Lifw / Lifw
V4.8	50 V hardware protection/reconnect-redial; 3150 Flash protection; serial parameters	2016-07-11	Yangzh, Lianqs / Lianqs
V4.9	Description corrections	2019-06-05	Liugb
V5.0	Added Cat 1 models	2020-06-08	Liugb
V5.1	Description corrections	2020-06-22	Liugb
V5.2	Company address and descriptions	2020-09-08	Liugb

1. Product overview and hardware families

Source pp. 7-13

CAIMORE DTUs provide industrial transparent TCP/UDP wireless data transfer. The source describes ARM9 or x86/RDC processors, real-time OS, a proprietary TCP/IP stack, reconnection/redial, virtual private networks, voice/SMS/data-triggered connection, timeout disconnection, dual-center backup and simultaneous multi-center delivery.

Networks listed are GPRS, CDMA, EDGE, WCDMA, EVDO, TD-SCDMA and LTE TDD/FDD. Interface families include RS232, RS485, TTL and USB. The generic overview claims -40 to +85 °C operation and a 3000KV electrical test; the later model-temperature table is narrower and a later test statement says 3000 V. These source conflicts are retained for review.

Applications include electric/water metering, heat/gas/water/environment/oil/security/weather/seismic monitoring. Industrial watchdog/VWM/Flash protection, low consumption and a 2010 supplier award are source claims.

System composition

Parameter	Source specification
3150/6550/8150/8250/8350	32-bit ARM9; 64 MB SDRAM / 8 MB Flash; industrial wireless module.
3160/6560	x86 RDC; 32 KB SDRAM / 512 KB Flash; industrial wireless module.

Parameter	Source specification
3180	32-bit ARM7; 400 KB ROM, 400 KB file-system ROM, 100 KB RAM; industrial wireless module.
3181	Industrial wireless module; processor/memory not specified here.

Family functions

Parameter	Source specification
Protection	Software/CPU watchdog, external hardware watchdog, SWP and additional software/hardware Flash protection; layer counting follows source wording.
Networking	Automatic DNS, TCP/IP, APN/VPDN, dynamic-domain/fixed-IP centers, two-center backup and multi-center simultaneous delivery. Generic text says up to 256 centers; detailed table says 8/4/4/2 by family.
Features	TCP/UDP transparent modes, heartbeat, RSA/RC4 as listed, data status reports, AT interface, modem/TRNS mode, remote configuration/control/wakeup, serial software upgrade.
Conditional features	SMS/voice/data wake and timeout; SMS backup/alarms; SMS remote settings on 3180; online I/O notification; six I/O inputs/outputs on 3180EP.
Host systems	Linux, UNIX and Windows are listed without clarifying host/device scope. This does not establish those operating systems run on every DTU.
Architecture	Processor/memory links to cellular module/SIM/antenna, RS232/RS485 user interface, indicators, reset, clock and secondary power supply.

1.1 Model inventory

Source pp. 7-8

V-suffix products replace the original corresponding EP-suffix products as noted in the source. Serial framing, RS485/TTL, low-power and SMS capabilities vary by row; use the following family-specific interface and configuration tables rather than treating them as universal.

RS232 DB9 variants

Model(s)	Network in source	Buffer
CM3150P / CM3160P	GPRS	1 MB / 8 KB
CM6550P / CM6560P	CDMA	1 MB / 8 KB

Model(s)	Network in source	Buffer
CM8150P / CM8250P / CM8350P	WCDMA / TD-SCDMA / EVDO	1 MB
CM510-21H / 21T / 21F	HSPA+ / LTE-TDD / LTE-FDD	1 MB
CM510-11T / 11F	LTE/GSM / LTE-FDD	8 KB

VGA / TTL variants

Model(s)	Network in source	Buffer
CM3150V / CM3160V / CM3180V	GPRS	1 MB / 8 KB / 2 KB
CM6550V / CM6560V	CDMA	1 MB / 8 KB
CM8150V / CM8250V / CM8350V	WCDMA / TD-SCDMA / EVDO	1 MB
CM510-23H / 23T / 23F	HSPA+ / LTE/GSM / LTE-FDD	1 MB
CM510-13T / 13F	LTE/GSM / LTE-FDD	8 KB
CM510-14T / 14F	LTE/GSM / LTE-FDD	1 MB

Terminal variants

Model(s)	Network in source	Buffer
CM3151 / CM3161 / CM3181	GPRS	1 MB / 8 KB / 2 KB
CM6551 / CM6561	CDMA	1 MB / 8 KB
CM8151 / CM8251 / CM8351	WCDMA / TD-SCDMA / EVDO	1 MB
CM510-22H / 22T / 22F	HSPA+ / LTE/GSM / LTE-FDD	1 MB
CM510-12T / 12F	LTE/GSM / LTE-FDD	8 KB

1.5 Serial, power and temperature limits

Source p. 13

Serial framing

Parameter	Source specification
3150/6550/8150/8250/8350	Baud 300/600/1200/2400/4800/9600/14400/19200/38400/57600/115200; 7/8 data; NONE/ODD/EVEN/SPACE/MARK; 1/2 stop; none or hardware flow.
3160/6560	Baud 110/300/1200/2400/4800/9600/14400/19200/38400/57600/115200; 8 data; NONE/ODD/EVEN; 1 stop; no flow.
3180	Baud 1200/2400/4800/9600/14400/19200/38400/57600/115200; 5/6/7/8 data in hardware table, 7/8 in configuration section; NONE/ODD/EVEN/SPACE/MARK; 1/2 stop; no flow.
3181, configuration section	Same listed baud range as 3180; 8 data; NONE; 1 stop; no flow.

Other specifications

Parameter	Source specification
Antenna / SIM	SMA female 50 ohm; automatic 1.8/3 V SIM detection.
Standard supply	9 V DC / 1.5 A.
Input	3150/6550/8150/8250/8350: 7-32 V; 3160/6560 and 3180: 5-32 V. Generic feature text says 5-32 V.
Typical dimensions	93 x 62 x 23 mm excluding antenna mounts; exact model may differ.
Operating / extreme table	3150,6550,8150,8250,8350: -25 to +65 °C; 3160,3180: -30 to +70 °C; 6560: -30 to +75 °C. The operating/extreme columns repeat the same values.
Storage / humidity	-40 to +85 °C; 95% RH, non-condensing.

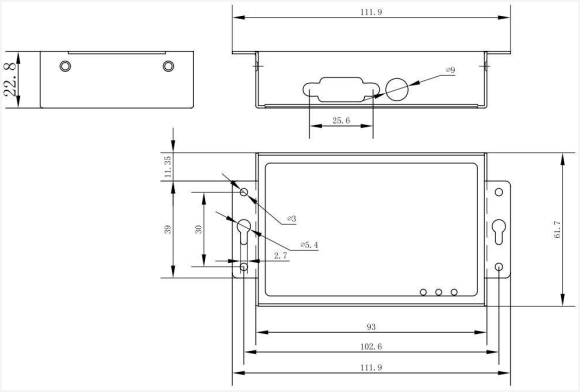
2. Installation and packing

Source pp. 14-16

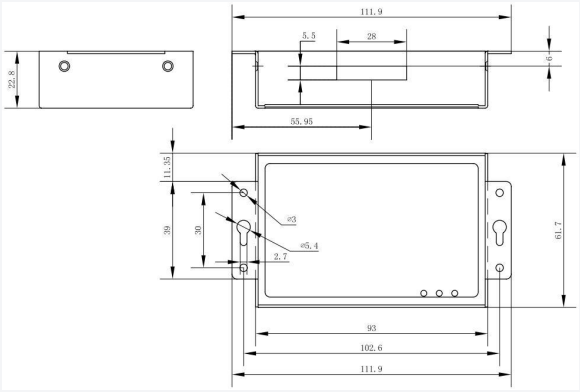
Install under qualified engineering guidance with power removed. Retain the packaging for transport. Metal enclosures have mounting holes; use the original P/EP dimensional drawings and the exact ordered model. Source accessory list includes a DIN rail despite revision V4.3 stating removal of DIN-rail installation.

- Fit the antenna to its SMA female base.

- SIM tray is on the antenna side. Press the yellow release button with a suitable pointed tool. Insert SIM with metal contacts UP, push tray fully until latched. Power must be removed before installation.



Original P enclosure drawing



Original EP enclosure drawing

Packing list

Parameter	Source specification
Standard	1 DTU, 1 adapter, 1 CD, 1 SMA dual-band vehicle antenna; 20-pin RS485 lead or DB9 RS232 crossover lead according to model.
Optional	High-gain dual-band SMA antenna, product rail and RS232 straight-through lead, as listed. Actual delivery follows the order.

2.3 DB9 interface definitions

Source pp. 16-18

CMxx60P: CM3160P / CM6560P / CM510-11T/F

Pin	Signal	Function
1	Online	Optional output: +5 V when connected to center, -5 V when disconnected.
2 / 3	RX / TX	RS232 receive input / transmit output.
4 / 6 / 8 / 9	NC	Unused.
5	GND	RS232 ground.

Pin	Signal	Function
7	SW	Newer boards only, specify at purchase: -10 to 0 V or floating ON; 3.3-30 V OFF; input -10 to +30 V.

CMxx50P: CM3150P/6550P/8150P/8250P/8350P, CM510-21H/21T/21F

Pin	Signal	Function
1	Online	+5 V connected / -5 V disconnected.
2 / 3 / 5	RX / TX / GND	RS232 input / output / ground.
4	Active	Sleep-mode I/O activation, reserved and temporarily unsupported.
6	Unused	No function.
7	SW / CTS	Default power control: -10 to 0 V/floating ON, 3.3-30 V OFF; optional CTS hardware flow, specify at purchase.
8	USB+ / RTS	Optional USB+ or RTS hardware flow; specify at purchase.
9	USB-	Optional USB-, specify at purchase.

2.3 VGA interface definitions

Source pp. 19-22

CMxx60V: CM3160V/6560V, CM510-13T/F

Pin	Signal	Function
1	Online	3.3 V connected / 0 V disconnected.
2 / 3 / 5	RXD / TXD / GND	RS232 input / output / ground.
4 / 6 / 7 / 8 / 14 / 15	Unused	No function.
9	SW	-10 to 0 V/floating ON; 3.3-30 V OFF.

Pin	Signal	Function
10 / 11	TTL_RXD / TTL_TXD	3.3 V TTL input/output.
12 / 13	485A / 485B	RS485 A/B.

CMxx50V: CM3150V/6550V/8150V/8250V/8350V, CM510-23H/23T/23F

Pin	Signal	Function
1	Online	Default 0/3.3 V; optional -5/+5 V, specify at purchase.
2 / 3 / 5	RXD / TXD / GND	RS232 input / output / ground.
4 / 6	Unused	No function.
7 / 8	RTS / CTS	RS232 hardware flow.
9	SW	-10 to 0 V/floating ON; 3.3-30 V OFF.
10 / 11	TTL_RXD / TTL_TXD	3.3 V TTL input/output.
12 / 13	485A / 485B	RS485 A/B.
14 / 15	USB+ / USB-	Optional; source calls + output and - input, which needs USB-interface verification.

CM3180V

Pin	Signal	Function
1 / 6 / 11	A1 / C1 / B1	Relay 1; CPU low connects A1-B1; CPU high disconnects A1-B1 and connects A1-C1.
2 / 3 / 5	RXD / TXD / GND	RS232 input/output/ground.
4 / 7 / 8	Unused	No function.
9	SW	-10 to 0 V/floating ON; 3.3-30 V OFF.
10 / 14 / 15	B2 / A2 / C2	Relay 2 labels; source repeatedly copies Relay 1/A1-B1-C1 prose. Exact relay-2 logic NEEDS_VERIFICATION.

Pin	Signal	Function
12 / 13	485A / 485B	RS485 A/B.
Relay rating	Dry contact	125 V AC / 0.5 A; 30 V DC / 1 A; optional, specify at purchase.

2.3 Terminal and 20-pin interfaces

Source pp. 22-25

CMxx61 terminal family

Parameter	Source specification
Models	CM3161/6561/8151/8251/8351, CM510-12T/F and CM510-22T/F, as listed.
Pins 1 / 2	Positive power 6-32 V / ground.
Pins 3 / 4	RS485 A/B.
Pins 5 / 6	RXD / TXD. The source reverses normal input/output descriptions in this table: verify before wiring.
Pin 7	Serial ground.
Pin 8	SW: 0 V/floating ON, 3.3-30 V OFF; do not exceed pin-1 supply voltage; source recommends deriving this level from pin 1.
Pins 9 / 10	RTS / CTS reserved, temporarily unsupported.
Pin 11	ONL: output 0/3.3 V, low disconnected / high connected.
Pin 12	ACT: reserved/temporarily unsupported; described as sleep/wake input 0/3.3 V with configurable active level.

CM3181 terminal

Parameter	Source specification
Pins 1 / 2	POWER 6-32 V / ground.
Pins 3 / 4	485A / 485B.
Pins 5 / 6 / 7	RXD / TXD / serial GND; signal descriptions and direction columns conflict.

Parameter	Source specification
Pin 8	SW: -10 to 0 V/floating ON, 3.3-30 V OFF.
Pins 9 / 10 / 11	Relay 1 A1/A2/A3; default A1-A2, SMS control changes to A1-A3.
Pins 12 / 13 / 14	Relay 2 B1/B2/B3; default B1-B2, SMS control changes to B1-B3.
Relays	Optional; dry contacts, 125 V AC/0.5 A or 30 V DC/1 A.

20-pin TTL BoxHeader, 2.0 mm pitch

Pin	Signal	Function
1	PIN_1	3180EP I/O; online output for 3150/6550/8150/8250/8350.
2 / 3	PIN_2 / PIN_3	3180EP I/O.
4	PIN_4	3180EP I/O; online output for 3160/6560.
5	PIN_5	Online output for 3180.
6 / 8	PIN_6 / PIN_8	3180EP I/O.
7	PIN_7	3180EP wake input.
9 / 11	Unused	No function.
10 / 12	TTL_RX / TTL_TX	TTL input/output, relative to DTU.
13 / 15	GND	Power ground.
14 / 16	232_RX / 232_TX	RS232 input/output, relative to DTU.
17 / 19	+5V	Positive power.
18 / 20	485_A / 485_B	RS485 positive/negative.

2.4 Power and 2.5 Network checks

Source pp. 25-26

External supply must handle fast registration-current peaks when the DTU exchanges information with the base station. Check wiring, attach antenna and insert an active SIM before power. POWER illuminates; Online flashes after network registration and remains on when connected to the server. ACT flashes for serial data, except the source says ACT is invalid on 3G DTUs.

3. Local, remote and SMS configuration

Source pp. 26-29

- Local tool: connect PC and DTU serial ports first; select the correct product type/model and COM; 115200 baud, 8 data, no parity, 1 stop, no flow; click Open and THEN apply power when prompted. Choose Configuration State. Wait for Read configuration parameters: Success; edit and Save Configuration Parameters.
- Manual terminal: use 115200,8,N,1,no flow. Hold s while powering on until the configuration prompt/AT+LIST appears. Use the AT commands below, then restart. Source prefers the graphical tool.
- Network remote: after center connection, send ***COMMIT CONFIG*** without quotes. Wait for Remote Config Ready, send AT settings, then AT+RESET.
- SMS configuration is limited to 3180 in this manual and requires SMS service. Format ***COMMIT CONFIG***:AT-command; one parameter per SMS. Example ***COMMIT CONFIG***:AT+PORT=5001, wait for OK, then ***COMMIT CONFIG***:AT+RESET.



Original source interface reference, p. 27; software labels remain as supplied.

Configuration-tool family selection

Parameter	Source specification
CMxx50	DB9 P, VGA V, terminal xx51 and original 20-pin EP variants of 3150/6550/8150/8250/8350 and CM510-21/22/23/24 families as listed in the inventory.
CMxx60	3160/6560 and CM510-11T/12T/13T/14T families.

Parameter	Source specification
CM350 / CM3x0	CM350P/V/EP, CM360P/V/EP, CM510-11T/13T/14T.
CMxx50_TC_M2M	6550/8350 P, V, xx51 and EP variants.
CMxx50-SERVER	Matching -SVR P/V/terminal/EP versions; source explicitly lists server builds.
CMxx80 / CM3181	CM3180P/EP / CM3181 terminal.
Special models	Tool logs show applicable model names; special functions are not explained universally in this manual.

4. Quick configuration and 5. Batch configuration

Source pp. 30-35

- Select DTU and the correct family, open the serial port at 115200,8,N,1,no flow, choose Configuration State and apply power at the prompt. Wait for successful parameter read.
- In Quick Configuration, set main-center address/port and backup address/port. If only one server exists, copy main values into backup fields.
- Match the connected equipment baud, parity, data bits, stop bits and flow exactly. Set an 8-digit hexadecimal ID and an 11-digit decimal SIM identifier. TCP normally identifies by ID; UDP by SIM identifier. Single-device testing may retain defaults.
- Save Configuration Parameters. For xx50/xx60, use tool version 5.6.19 or later so it disables Flash write protection automatically. Otherwise settings may appear unchanged after saving. Manual command: AT+WRFLASH=7k35pF, case-sensitive.
- Export: enter configuration/read parameters, File > Export Configuration Parameters, choose path/name and Save.
- Import: select matching DTU family and enter configuration, File > Import Configuration Parameters, select file and Open. This imports into the tool; use the normal save-to-device procedure. Repeated model-selection tables are consolidated above.

6.1-6.6 Centers, DNS, private APN and identifiers

Source pp. 35-42



Original source interface reference, p. 39; software labels remain as supplied.

Fields and steps

Parameter	Source specification
Single fixed-IP center	Quick Configuration: double-click Value and fill main/backup IP and port. Center Server Parameters: center count 1 (default). If no backup exists, duplicate the main endpoint.
Single domain center	Use registered domain instead of fixed IP; fill ports and center count 1.
Multiple centers	Center Server Parameters: set count, then address/port for centers 1 through N. Domain mode uses registered domain names in those address fields.
Detailed maximum centers	CMxx50 8; CMxx60 4; CMxx80 4; CMxx81 2. Generic text elsewhere says 256: NEEDS_VERIFICATION.
DNS	Set main/backup DNS if needed; otherwise use operator-assigned DNS. For 3160/6560 unspecified DNS is 0.0.0.0; other families use blank. Backup DNS may remain blank. Ensure configured servers resolve the center domain.
Private network	Activate APN/private service with the operator, then fill Wireless Network APN, APN Username, APN Password and Dial Center Number from operator data. Source examples are historical.
Device ID	Exactly 8 hexadecimal digits.
SIM identifier	Exactly 11 digits; need not be the actual SIM phone number, as explained in the source. TCP normally uses ID, UDP normally this identifier.

Source operator examples

Network	Dial number	APN	Username/password
Mobile GPRS	*99***1#	CMNET	Blank
Mobile TD-SCDMA	*98*1#	CMNET	Blank
Unicom GPRS	*99#	UNINET	Blank
Unicom WCDMA	*99#	3GNET in section 6.5; UNINET in appendix	Blank
Telecom CDMA/EVDO	#777	Blank	card / card

6.7 Serial configuration and 6.8 Wake modes

Source pp. 42-46, 52

In Quick Configuration, double-click the serial parameter Value and choose the matching downstream-device baud, parity, data/stop bits and flow. Family values are listed in section 1.5 above. NONE means no parity in the parity field and no flow in the flow-control field; source mistakenly describes NONE as no parity in its flow section.



Original source interface reference, p. 45; software labels remain as supplied.

Wake behavior

Parameter	Source specification
NONE	Power-on automatic dialing/center connection; no normal sleep.
SMS	Wake on matching SMS content. Configure SMS Wake Password; blank permits any message, which the source advises against.
PHONE	Wake on calls from Control Number; SIM caller-ID service required. Blank allows any caller, which the source advises against.

Parameter	Source specification
DATA	Wake on Serial Wake Data; sleep on Serial Sleep Data. Wake text cannot be blank; blank sleep text disables data-triggered sleep. CMxx50 cannot use Chinese text for these strings.
MIX	SMS, phone and data triggers combined; any matching trigger wakes. Configure their corresponding fields.
IO, 3180	Wake while selected pin is at the configured level; opposite level sleeps. Select 0 for low-active, 1 for high-active. Source high/low wording contains a typo.
Wake duration, 3180 only	Seconds. 0 keeps working until link closes; >0 returns to sleep after that period. Server disconnect can also return the unit to sleep.
Byte notation	abc directly or 0x610x620x63; TAB 0x09; mixed abc0x09 or 0x610x620x630x09.

6.9 Communication protocols and packet customization

Source pp. 46-52

Default link/data exchange follows CAIMORE protocols. Server compatibility is indicated by use of the CAIMORE DTU library, implementation of the source TCP/UDP protocol, or a CAIMORE-named SCADA driver; otherwise ask technical support. The source p. 48 comparison matrix is retained among the reference figures because several values are embedded screenshots.

xx60 transparent TCP, recommended source configuration: sends FE keepalive each minute without user data and still sends registration on first connection. User data within the minute serves the keepalive role. If FE interferes, alternatives require either downstream-device data or center-to-DTU data at least every 300 seconds; source recommends within 250 seconds. Failure triggers reconnect with a 30-60 second gap, during which user serial data may be discarded. xx80 has analogous behavior. Match the source parameter matrix to firmware before use.



Original protocol setting matrix (source p. 48); English explanations follow.

Packet text rules

Parameter	Source specification
Default	<DEFAULT> or blank sends the default packet. Source explanatory notes also say type DEFAULT without brackets; verify tool syntax.
Disabled	<NONE> suppresses the packet. Source explanatory notes also say type NONE.
Tokens	<ID> inserts the ID; <PHONE> the SIM identifier; <IP> the local IP. Tokens may be combined with other characters.
Visible characters	Enter abc directly or as 0x610x620x63.
Control characters	Use 0x-prefixed hexadecimal ASCII bytes; TAB is 0x09.
Combined example	abc<ID><PHONE><IP>0x0A or 0x610x620x63<ID><PHONE><IP>0x0A for a line feed. This is the 7X manual example.

Specific caveats

Parameter	Source specification
V5.2 control-character example	Source calls 0x10 a carriage return in abc<ID><PHONE><IP>0x10 or 0x610x620x63<ID><PHONE><IP>0x10. The byte is retained as printed, but the character description is inconsistent: NEEDS_VERIFICATION.
xx81 transparent mode	Source says custom registration/heartbeat/acknowledgment text is ignored and default packets remain.
UDP replies, 3180 / 3181	Registration acknowledgment and heartbeat acknowledgment apply in UDP mode. <DEFAULT>/blank selects default, <NONE> suppresses, custom string configures content. Some source labels mistakenly refer to heartbeat under registration; confirm behavior.

6.10 Modes, 6.11 Heartbeats and 6.12 Recovery

Source pp. 52-55



Original source interface reference, p. 54; software labels remain as supplied.

Runtime fields

Parameter	Source specification
TCP	Most common/default mode; serial payload over ordered, acknowledged TCP with retransmission.
UDP	Connectionless, non-guaranteed delivery for frequent data where that behavior is acceptable.
TRNS	Pass serial traffic directly to the wireless module; host supplies TCP/IP, using DTU as a modem. xx81 instead labels modes NET and TRNS.
3160 TRNS recovery	Newer firmware auto-detects missing module response after outgoing user data and resets. Manual reset string: *** RESET DTU ### Get Right ***.
Heartbeat time	Normally leave default; avoid excessive interval or no heartbeat. Align server inactivity limits. If heartbeat content is <NONE>, source says this time becomes the server-reconnect interval.
Reconnect attempts	Failed center attempts before hanging up/redialing. Source advises default and discourages 0 or very large values.
Reconnect interval	Retry interval when no center is connected; 0 disables this parameter.
Multi-center reconnect interval	Retry failed other centers when at least one center is connected.
Redial count	Dial attempts before automatic device restart; avoid excessive counts, source recommends defaults.

6.13 Packetization through 6.16 SMS administration

Source pp. 55-59



Original source interface reference, p. 57; software labels remain as supplied.

Fields and behavior

Parameter	Source specification
Packetization	Send when serial data exceeds configured TCP Data Unit Size or when no further byte arrives within Inter-byte Packetization Interval. Too short splits messages; too long merges them. Tune to application traffic; request support if needed.
Full-speed send, xx80	Value 1 enables immediate sending without packetization buffering; 0 disables.
Debug level	0: no diagnostic serial output, source recommends for normal operation. 1: partial output, factory default. 2: all output. If equipment cannot filter debug data, use 0; source discourages 2 with live equipment.
Local port, 3180	Configurable only for a single center; multi-center must use 0. Operator NAT may change the observed server-side port; source says normally effective on private APN.
Remote SMS configuration, 3180	Set authorized Control Number; without it SMS administration is unavailable. Verify SIM SMSC. Source says Telecom uses no SMSC; actual operator details take precedence.
SMSC	Network Parameters > SMS Center Number.
Authorized phone	Wake Parameters > Control Number.

6.17 Six-channel I/O on 3180EP

Source pp. 59-62

Each of six I/O pins can have one function at a time; different pins may have different functions. Verify SMSC. Configure in I/O Input/Output Parameters. Up to five authorized/receiving phone numbers per channel, separated by semicolons.



Original source interface reference, p. 60; software labels remain as supplied.

I/O configuration

Parameter	Source specification
Output	Function 2; set power-on level 0 low / 1 high and authorized control numbers.
Output command	SMSCTRL:PINn:m, n=1-6, m=0/1. Multiple commands separated by semicolons. Example SMSCTRL:PIN1:1;PIN2:0.
Output example	Channel1 function2/start level0; channel2 function2/start level1; both authorize 13812345678. Example message makes channel1 high and channel2 low.
Input alarm	Function1; alarm level0 detects falling edge, level1 rising edge; set recipients and alarm content. Example channel1 function1/level1, recipient 13812345678, message ALARM1.
Level semantics	For input, level determines the detected edge. For output, it determines driven level.

6.18 SMS data channel

Source pp. 62-65



Original source interface reference, p. 63; software labels remain as supplied.

Settings and procedures

Parameter	Source specification
Format	***SEND SMS***:message; no preceding content and message cannot be empty. Source recommends a 1-second gap before/after sending.
Example	***SEND SMS***:hello sends hello to the configured phone when enabled.
Allow SMS during communication	0 disallows; 1 allows formatted SMS send commands in normal communication.
Enable channel	0 disables; 1 permits serial data to use SMS during abnormal/disconnected states. The source recommends NOT enabling this fallback.
Success / failure prompts	Custom serial feedback strings after the SMS operation. Source failure paragraph mistakenly calls its feedback the success prompt; intended field is Send Failure Prompt.
Data phone number	Destination for the configured SMS channel.
Length	Source says content beyond 140 bytes is not received by the SMS phone and is forwarded to the data center; confirm actual encoding/firmware behavior.

6.19 Server modes

Source pp. 65-67

xx50 and xx60 can accept other DTU clients as servers. Source requires private-network SIMs. xx50 requires server-version firmware; xx60 does not require reflashing for this mode.



Original source interface reference, p. 66; software labels remain as supplied.

xx50 server fields

Parameter	Source specification
Listen port / clients	Listening endpoint; maximum 32 simultaneous clients.
Minimum / maximum ID	Allowed client ID range, applied only if Verify ID is enabled.
Client timeout	Remove clients exceeding the allowed data interval.
Verify ID	Enable range filtering, or accept without ID-range check.
Replace client	Replace an older connection with a new one using the same ID; source recommends enabling to avoid duplicate slots after reconnect.
Broadcast data	Send outgoing data to all connected clients.
Keepalive interval / retries / IP1-3	Periodically probe reachable specified targets to judge connectivity.
LCP interval / count	PPP checks; source reports poor practical effectiveness and discourages use.
Keepalive timeout	Source says power-cycle/reconnect if client data remains absent beyond this limit.

xx60 server fields

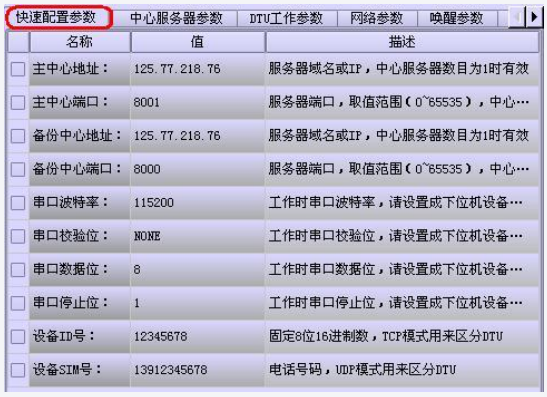
Parameter	Source specification
Listen port / clients	Private-SIM listening port; up to 5 clients.
Keepalive mode	Source discourages enabling; use public probe addresses when client inactivity otherwise obscures link state.

Parameter	Source specification
Keepalive IP1 / IP2	Reachable probe addresses.
Keepalive interval	Probe period when mode enabled; when NONE, source says periodic restart instead. Verify exact firmware before use.

7. Data transfer and remote-configuration experiment

Source pp. 68-74

- Source topology: server LAN 192.168.1.22, external router IP 125.77.218.76, router LAN 192.168.1.10; demo listens on 8001. A serial-connected PC simulates the field equipment. VC/VB/Delphi demo versions are mentioned; VB is the example.
- Enter DTU configuration using the correct family and 115200 serial connection. Set main/backup center addresses and ports, save and restart into Communication State.
- Server PC example: Control Panel > Network Connections > Local Area Connection > Properties > Internet Protocol (TCP/IP). IP 192.168.1.22, mask 255.255.255.0, gateway 192.168.1.10; save.
- If the server is behind a router, add NAT/port forwarding to the server and verify the mapping in the router list. Direct-public-IP server does not need this router mapping.
- Start demo listener on 8001, select Restart and Enter Communication State in the DTU tool. If necessary power-cycle after selecting communication mode. Wait for connected; inspect server client information.
- Server-to-DTU: Data Send, select target ID, enter Test and Send; verify Test in the serial tool and server log. DTU-to-server: send Test from serial input; inspect Received Data in the demo.
- Remote changes: select Remote Control and DTU ID, Enter Configuration, wait for success. Enter AT commands in Direct AT Remote Modification; press Enter/Send. Restart DTU after edits. Do not alter uncertain network/APN/dial/IP/port values that could prevent reconnection.



Original source interface reference, p. 68; software labels remain as supplied.

8. Temporary modem / dial-up use

Source pp. 74-85

The source generally discourages using the DTU as an ordinary modem. CDMA requires the supplied four-core cable. This is a historical Windows dial-up procedure, not a statement of present operating-system compatibility.

- 1. Set TRNS. Control Panel > Phone and Modem > Add. Select Do not detect; choose from list. Select Standard 33600 Modem and the actual COM port; complete installation.
- 2. Open modem properties; set maximum port speed 115200. Advanced > Change Default Preferences; configure Extra Initialization Command from the table below. Set 115200 and flow control None.
- 3. Network Connections > Create a New Connection > Connect to the Internet > Set up manually > Connect using dial-up modem. Windows 2000 wording differs as shown in the original wizard.
- 4. Select Standard 33600 Modem, enter any identifying ISP name, dial number and credentials from the table; Finish.
- 5. Open connection Properties, confirm modem and number, Configure, set maximum speed 115200 and disable hardware flow control.
- 6. Open the example GPRS_COM connection and click Dial. Source shows a connection-status icon on success, then browser access.



Original source interface reference, p. 77; software labels remain as supplied.

Historical dial-up reference

Network	Initialization	Dial number	Credentials
GPRS	AT+CGDCONT=1,"IP","cmnet"	*99***1#	Blank
TD-SCDMA	AT+CGDCONT=1,"IP","cmnet"	*98*1#	Blank
CDMA / EVDO	Blank	#777	card / card
WCDMA	AT+CGDCONT=1,"IP","uninet"	*99#	Blank

Appendix 2. AT command reference

Source pp. 86-88

Commands are reproduced as command names; parameter values and model applicability follow the detailed sections. Source generic All Models labels do not override narrower hardware limits.

Operating commands

Parameter	Source specification
ATE0 / ATE1	Echo off / on.
AT+LIST / AT+SHOW	Command list / current parameters.
AT+QUIT / AT+RESET	Exit / restart.
AT+VER / AT+FACTORY	Version / factory reset.
AT+STATUS	Current status; 3180 only.

Center and serial commands

Parameter	Source specification
AT+SVRCNT	Center count.
AT+IPAD / AT+PORT	Main center address / port.
AT+IPSEC / AT+PTSEC	Backup address / port; IPSEC is a field command here, not a VPN claim.
AT+IPAD1 to AT+IPAD8	Center 1-8 addresses; obey family center limits.
AT+PORT1 to AT+PORT8	Center 1-8 ports; obey family center limits.
AT+DNS / AT+DNS2	Primary / backup DNS.
AT+IPR	Baud: 115200/57600/56000/38400/19200/14400/9600/4800/2400/1200/600/300/110; source says 50/60 do not support 56000.
AT+PARITY	NONE/EVEN/ODD/SPACE/MARK; family restrictions apply.
AT+DATABIT	5-8; 50/60 do not support 5/6.
AT+STOPBIT	1-2; family restrictions apply.

Parameter	Source specification
AT+FLOWCTRL	NONE or FLOWCTRL.

Runtime and network commands

Parameter	Source specification
AT+MODE	TRNS/TCP/UDP; xx81 uses NET/TRNS in main text.
AT+DEBUG	Debug level.
AT+BYTEINT	Inter-byte packetization interval.
AT+RDLWT / AT+RETRY	Reconnect interval / attempts.
AT+MULTIRDLWT	Multi-center reconnect interval.
AT+POLLTIME / AT+TCPMTU	Heartbeat time / packet size.
AT+REDIAL	Redial count; 3180 in appendix.
AT+LOCALPORT	Source describes local IP, but main text configures local port; 3180. NEEDS_VERIFICATION.
AT+APN / AT+USERNAME / AT+PASSWORD	APN and private-network credentials.
AT+CENT / AT+SMSC	Dial-center number / SMS center.
AT+ID / AT+PHONE	Device ID / phone-SIM identifier.
AT+RGSTPKT / AT+HTBPKT	Custom registration / heartbeat.
AT+RGSTACK / AT+HTBACK	Registration / heartbeat acknowledgment; 3180 in appendix.
AT+STRAIGHT	Whether escaping is used.

Wake and I/O commands

Parameter	Source specification
AT+ACTI	NONE/SMS/PHONE/DATA/MIX/IO; hardware restrictions apply.
AT+CTRLNO / AT+SMSPSWD	Authorized phone / wake SMS.

Parameter	Source specification
AT+DONPSWD / AT+DOFFPSWD	Serial wake / sleep data.
AT+WAKEL / AT+ACTITIME	I/O wake level / wake duration; 3180.
AT+PINF1 to AT+PINF6	I/O1-6 function; 3180.
AT+PINL1 to AT+PINL6	I/O1-6 level; 3180.
AT+ALARMPHONE1 to AT+ALARMPHONE6	I/O1-6 control phone lists; 3180.
AT+ALARMMSG1 to AT+ALARMMSG6	I/O1-6 alarm contents; 3180.

Appendices 3-6. LEDs, consumption, terminal and faults

Source pp. 88-92

Consumption figures are source measurements under normal signal, for reference; actual local network conditions affect consumption.

Indicator meanings

Parameter	Source specification
POWER	On powered / off unpowered.
Online	Steady center-connected; flashing GPRS-registered; off not registered.
ACT	Flashes on data; off no data; invalid on 3G devices.

Source measured reference current at 9 V

Family	Awake	Connected, idle	Connected, data
3150	90-100 mA	90-100 mA	160 mA
6550	110 mA	110 mA	200 mA
3160	50-60 mA	50-60 mA	90-110 mA
6560	60 mA	120 mA	120 mA

Family	Awake	Connected, idle	Connected, data
3180	20 mA	20 mA	90-110 mA
8150/8250/8350	160-210 mA	160-210 mA	270-280 mA

Terminal and troubleshooting

Parameter	Source specification
HyperTerminal	Start > Programs > Accessories > Communications > HyperTerminal; name connection, select actual COM, 115200,8,N,1,no flow. File > Properties > Settings > Input Conversion uses original screenshot encoding. Verify legacy encoding before entering non-ASCII commands.
POWER off	Check cable and approved supply.
Online off	Check coverage/signal/SIM, center software and firewall.
ACT off	3G ACT does not flash; other models flash only with data.
No reconnect after center restart	With a single server, fill backup IP/port with the main server values.
LEDs normal, no data	Confirm data service/coverage and destination address/port.
Cannot configure	Choose Enter Configuration State; verify cable and 115200,8,N,1,no flow, regardless of runtime serial baud. Hold S before power or repeatedly press immediately after powering on until the menu appears.

Appendices 7-8. TCP / UDP protocol reference

Source pp. 92-94

TCP registration and heartbeat acknowledgments are disabled by default in the source. The default heartbeat is FE and application data is normally transparent. Source advises obtaining FE escaping rules from technical support. Packet diagrams are retained among the original reference figures.

TCP registration packet

Parameter	Source specification
ID	4 bytes; 8 hexadecimal digits.
PHONE_NUMBER	11 bytes, ASCII phone/SIM identifier.

Parameter	Source specification
0	1 separator byte.
IP_ADD	4 bytes, acquired dynamic IP in hexadecimal representation.
ETX	1 byte, 0x00; packet terminator.
Total	21 bytes. Source recommends keeping this length when using the manufacturer demo with a modified registration packet.
Heartbeat	Default byte FE after 60 seconds without traffic. Data containing FE requires escaping; obtain the exact escape rules from CAIMORE before implementing a server.

Legacy UDP acknowledgments and local port

Parameter	Source specification
Registration/heartbeat	0x7b; type 0x01; length 0x0016; identifier 11 bytes; IP4; port2; end0x7b.
Registration acknowledgment	xx50/xx80: start0x7b, type0x81, length field printed 0x10 in a two-byte field, identifier11, end0x7b. xx60/xx81: no default reply.
Heartbeat acknowledgment	Same xx50/xx80 acknowledgment layout; xx60/xx81 no default reply.
Local port	xx50/xx60 randomly allocated; xx80/xx81 can specify a fixed port in runtime parameters. Source says default0 while actual allocation is random; representation needs firmware confirmation.
Timing	Registration on first connection; heartbeat after 60 seconds without traffic; heartbeat also acts like registration if disconnected.
Data	Source states transparent data delivery; exact escaping, byte order and field length must be obtained from firmware protocol documentation.

Translation and source review notes

Editorial review, not additional manufacturer specifications

Translated from the supplied Chinese file. Repeated page furniture and repeated procedures are consolidated. Original hardware figures are preserved; Chinese software screenshots remain visual references with English explanations. NEEDS_VERIFICATION identifies unresolved source issues. No device tests or website upload have been performed.

Review checklist

Source / topic	Review note
Electrical limits	Generic -40 to +85 °C operating claim conflicts with narrower per-family ratings. 3000KV vs 3000V test statement; supply/pin limits vary by family. Do not correct these by assumption.
Pins / relay logic	CMxx61 RXD/TXD direction reversed; CM3181 direction columns conflict; CM3180V relay2 text copies relay1; optional/reserved pins and switch voltage limits need hardware confirmation.
Capacity / framing	Generic 256 centers vs detailed 8/4/4/2; 3180 data bits differ between sections; generic AT table permits values not supported on every family.
Protocol ambiguity	DEFAULT/NONE bracket notation, 0x10 called carriage return, two-byte UDP length examples and LOCALPORT described as local IP need firmware verification. No byte order or escape rules invented.
Historical software	Windows dial-up and HyperTerminal workflows, old networks, contacts and operator values are source-era references, not current availability or OS compatibility claims.
Translation scope	Repeated model tables and repeated double-click/Value steps are consolidated; all numbered functional topics are represented. Original UI screenshots remain Chinese references in assets.
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.