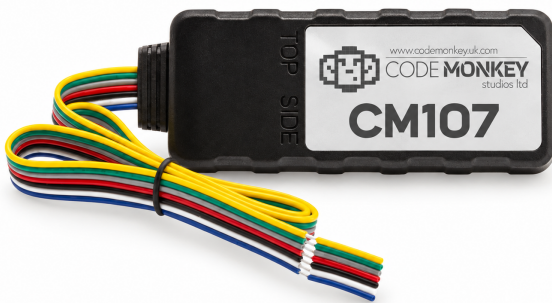


CODE MONKEY FIRMWARE

CM107 + CM212

Vehicle tracking, local control and customer-owned privacy

A guide to the new Code Monkey firmware for the CM107 wired tracker and CM212 battery-mounted tracker. Both use a shared feature platform, with output options matched to their hardware.



CM107



CM212

CM107

Wired installation with ignition, a shared analogue/digital input and an internal output.

CM212

Two-wire installation at the vehicle battery; output control through a compatible Bluetooth relay.

What is new

High-detail Track mode; timed outputs; local logging and scheduled reporting; Bluetooth tags, relay and phone control; continuous motion calibration and tilt tamper; encrypted telemetry and Level 3 vault provisioning; expanded offline storage, recovery and assisted GPS.

Scope: cumulative CMS 25.02.x development, including Track mode added in 25.02.42. A feature licence enables selected advanced functions; the final page explains the current licensing rules. Product photographs are Code Monkey branding mockups based on the manufacturer images.



01 / MODEL CAPABILITIES

Two devices, one platform

CM107: wired vehicle integration

CM107 is the Code Monkey name for the TVC107 hardware running CMS firmware. It combines vehicle tracking with a positive ignition input, a shared analogue/digital input and one wired output. A Bluetooth relay can be configured independently of the internal output, allowing the same software controls to target either.

CM212: simple battery-terminal installation

CM212 is the Code Monkey name for the TBC212 hardware running CMS firmware. It is powered from the vehicle battery through two leads, with a small backup battery. It is not a standalone long-life battery asset tracker. Ignition can be inferred from movement or supply voltage; compatible Bluetooth relays provide output switching without a wired output on the tracker.

Capability	CM107	CM212
Tracking, motion, stored records	Shared CMS platform	Shared CMS platform
Ignition source	Wired ignition, movement or voltage	Movement or voltage
Analogue / digital input	Shared terminal with selectable mapping	No external input terminal
Internal output	One independently controlled output	None
Bluetooth relay output	Compatible configured relay	Compatible configured relay
Housing rating / supply*	IP54 / 10-90 V DC	IP67 / 10-90 V DC
Special modes / encryption	Available subject to settings and licence	Available subject to settings and licence

* Hardware ratings are from the manufacturer product pages, not new firmware certifications. Hardware revision, receiver and peripheral compatibility must be checked for the specific unit. Renaming the products does not change the firmware package model guards.

Image and hardware sources: [TVC107 product page](#) and [TBC212 product page](#).



02 / CORE FIRMWARE

Tracking and vehicle events

Flexible normal reporting

Configure moving and stationary reporting separately, with home, roaming and unknown-network profiles. Time, distance, course change and speed-change conditions can drive acquisition. Reports carry UTC time, position, speed, heading, altitude and the selected I/O values in Codec 8E records. On-demand recording can create an immediate report without replacing the normal schedule.

Configurable I/O and ignition

Choose measurements, priority, threshold conditions, averaging and event-only reporting. Ignition and movement can generate on-change records. On CM107, analogue input 1 can remain an analogue measurement or emulate digital input 2 using a configured voltage cutoff: above the cutoff is on; below it is off. Digital input 1 reports the actual wired ignition input separately from the chosen logical ignition source.

Driver behaviour and trip information

Configurable scenarios cover harsh acceleration, braking and cornering, crash events, excessive idling, external-power removal, trip state and odometer information. Automatic geofencing can use a parked position as a reference; up to 50 configured circular or rectangular zones provide location-based event rules. The operator table supports up to 50 roaming entries.

Continuous vehicle-axis calibration

Calibration learns gravity and the vehicle direction from suitable stationary readings and driving, rather than treating sensor mounting axes as vehicle axes. It continues validating the mounting and can invalidate and relearn after a significant change. Accelerometer-based driver-behaviour classification is suppressed while calibration is invalid; calibration status can be reported with events.

Tilt tamper protection

A separately saved gravity reference detects a sustained change in mounting angle. Configure the angle, confirmation period, alert priority and speed suppression. A confirmed event is latched for that boot and invalidates vehicle calibration. An authorised remount requires an explicit tamper-reference reset. This detects tilt, not displacement or rotation around a vertical axis. A tilt-tamper licence is required.



03 / RECORDING POLICY

Track mode and specialist modes

Track mode: detailed journeys

Track mode starts detailed recording when motion is detected. On a positively identified supported CC1167Q receiver it requests 250 ms navigation periods: a target of four fixes per second, not 250 Hz. Unknown or unsupported receivers retain their native rate. Only new valid fixes are recorded; missing fixes are not filled with repeated coordinates.

The dedicated Track stream contains GPS fields and available calibrated X/Y/Z accelerometer readings. Up to four chronological fixes are grouped in one Codec 8E packet, normally requested for upload once a second. These are full timestamped records, not invented extra element IDs. Normal reporting continues in separate packets with its saved I/O settings. Network delays can change delivery timing.

Track mode sends a start event and a stop event after 60 seconds without motion or fresh moving GPS. It then remains armed for the next movement. Enable it until turned off, or for whole minutes/hours up to 168 hours. Timed mode needs valid UTC, counts from activation and resumes only the remaining period after reboot. No separate Track-mode licence bit is currently assigned.

Stun and Log

Stun turns off tracking, logging, GPS, modem and Bluetooth until a chosen local date/time. Log continues capturing records locally with the modem off until the selected deadline. Both are separately licensed and use a cancellation grace period before activation.

Log Repeat

Record locally for a selected 1-720 hour interval, then attempt to upload, repeating until cancelled. The mode is intended for intermittent communications rather than continuous live reporting. It requires its own licence and retains the existing bounded journal and upload policies.

Periodic reporting

Choose up to six local-time reporting slots for each weekday. GPS, modem and Bluetooth are off between scheduled updates; movement does not override this mode. At a slot the tracker obtains a fresh fix or records a no-current-fix result, then makes a bounded upload attempt of up to 15 minutes. Periodic mode is separately licensed and respects the configured time zone and daylight-saving rules.



04 / LOCAL INTERACTION

Bluetooth and output control

Configured tag monitoring

Monitor configured Bluetooth tags and report presence changes through the telemetry system. Tag behaviour depends on the configured identifiers, scanning settings and supported advertising format. This feature is separately licensed; general BLE hardware capability does not imply support for every third-party sensor or relay.

AirTag-style advertising

Licensed advertising allows the tracker to transmit the configured AirTag-style identity. This is an advertising function, separate from cellular location reporting and from receiving tags. It does not turn the device into a certified Apple AirTag or guarantee discovery or location through a third-party network.

Bluetooth relay and internal output

Control a supported configured Bluetooth relay through the firmware output policy. CM107 also exposes its wired output independently; CM212 does not have an internal wired output. Relay control is separately licensed. A commanded state or accepted request is not proof that an external circuit has changed state.

Phone output access

An authorised phone can list outputs, read their reported states and request on/off changes over Bluetooth without cellular coverage. Access keys have slot, permission and lifetime settings, with authenticated sessions and sequence checking. CM107 can expose both the internal output and a relay; CM212 exposes its configured relay. Phone-output access requires its own licence, plus the relay licence when controlling a Bluetooth relay.

Timed control: six actions per day

The Timed control tab provides up to six time/action slots for each weekday. Select Bluetooth relay on/off, or CM107 internal output on/off. It uses local time and daylight-saving settings; missed slots are not replayed after a power-off, and repeated daylight-saving times execute once. Existing output safety and licence rules still apply. Timed control has no separate licence bit; Bluetooth actions require the relay licence. Scheduled reboot is not an action in this six-slot feature.

05 / DATA OWNERSHIP

Encryption and Level 3 privacy

Level 2: protected business telemetry

Level 2 retains normal device identification and server processing, while protecting the Codec 8E telemetry and command/acknowledgement exchange using the per-device configured key and session protection. The key is 32 bytes, commonly entered as 64 hexadecimal characters. The CMS encrypted transport must be supported by the receiving service; Codec 8E compatibility alone does not imply encrypted-transport compatibility.

Level 3: customer-owned data key

The phone vault provisions a data PSK, a 32-byte pseudonym and a separate, unique 32-byte acknowledgement PSK. The tracker uses the pseudonym for the Level 3 login and encrypts the Codec 8E payload using its data PSK. Chicane can store and acknowledge the encrypted envelope without decrypting the location data. The customer client downloads and decrypts it. Level 3 requires a licence.

The data PSK stays with the tracker and customer vault; Chicane receives the pseudonym and device ACK PSK for routing and authenticated acknowledgements. Commands are created and encrypted by the customer client and relayed to the tracker. The ACK key is distinct from the data key and is not one fleet-wide shared key. Pseudonym, envelope sequence, size and traffic timing remain visible metadata.

Enable first, provision when ready

Enabling Level 3 prepares the tracker but, while no data PSK has been installed, normal telemetry and password-based serial configuration continue. A power-on or fresh movement start arms a latched two-minute countdown followed by a 60-second Bluetooth connection window. Stopping movement does not cancel the countdown. Slow blue flashing indicates the wait; solid blue indicates the connection window; normal LED behaviour resumes afterwards.

Protection after provisioning

Once a PSK is stored, ordinary plaintext PC commands are blocked and configuration requires the protected Level 3 route. Provisioned Bluetooth changes require the owner authentication supported by the vault setup interface. Initial unclaimed setup relies on the owner controlling physical proximity. Level 3 records are encrypted in the local journal and ordinary IMEI/ICCID DMS registration is suppressed.

Physical recovery: L3RESET is the plaintext PC-only factory-reset route. It clears settings, keys, stored records and the licence. Reflashing the application is not a substitute for this reset. Any additional customer public-key wrapper is applied on the server side, not by the tracker.



06 / OPERATION AND RELEASE STATUS

Recovery, GPS and management

Expanded offline storage and recovery

The 4 MiB telemetry journal packs complete records efficiently and retains unacknowledged records through ordinary reconnects and restarts. Valid acknowledgements retire the selected records. Capacity is finite: the oldest stored records can be retired when the buffer fills. Retry delivery can repeat unacknowledged data, so receiving systems should handle duplicates.

Configurable recovery escalates failed delivery through network reattachment, modem power cycling and, when enabled and safe, a tracker reboot. Cooldown, power checks and protected-operation deferrals prevent repeated disruptive resets. Optional scheduled reboot is a separate recovery setting. Quiet specialist modes deliberately suspend communications; recovery does not override their policy.

GPS diagnostics, Force GPS and assistance

The configurator can show fix status, satellites, latitude/longitude, receiver time, speed and heading, plus receiver diagnostics where supported. Force GPS keeps requesting acquisition and event-ID-0 reports every five seconds until stopped; its lease also ends on serial disconnection. It cannot create a fix where reception is unavailable.

Supported receiver builds can obtain centrally cached A-GPS assistance from DMS over the dedicated TCP service. Refresh policies include ignition-on, first ignition of the day or an N-day interval, with a minimum refresh gap. CC1167Q download and injection were tested on the CM107-equivalent unit. Assistance format and support must be confirmed for other receiver variants, including CM212 units.

CMS Device Config and firmware updates

The web tool offers model tabs, status, licence import, configuration read/write, an Encryption tab, local named configuration storage and import/export. Firmware controls identify the model, show current and target versions, verify the package and separate upload from installation. Supported supplier-firmware migration is loader-specific. Ordinary application updates retain settings and licences; provisioned Level 3 restricts the plaintext update interface.

Release status, 12 October 2026: CM107-equivalent hardware booted 25.02.43 by serial with Boot:Succ. The DMS test for 25.02.44 failed after its header, with network loss; a complete remote installation is not validated. CM212 25.02.42 was built but not live boot-tested in this cycle. Sustained 4 Hz Track fixes and full phone/relay interoperability remain to be qualified. Feature descriptions are implementation scope, not a claim of completed hardware acceptance.

Basis: current CMS firmware modules and guides for Track mode, licensing, modes, motion/tamper, storage, recovery, A-GPS and phone output; current configurator; local COM10 validation record. Hardware images/ratings: linked manufacturer pages on page 2. Branding images were edited with the supplied Code Monkey logo using the built-in image tool.



07 / AFTER THE FEATURE DESCRIPTIONS

Licensing at a glance

A signed offline licence is tied to the modem IMEI and processor Chip UID. The licence grants permissions; the relevant feature must also be configured and enabled. Current licences do not expire. A replacement board or modem requires a matching new licence. Both models use the following ten feature bits.

Licensable feature	CM107	CM212	Bit / mask
Stun mode	Licence required	Licence required	0 / 00000001
Log mode	Licence required	Licence required	1 / 00000002
Log Repeat mode	Licence required	Licence required	2 / 00000004
Periodic mode	Licence required	Licence required	3 / 00000008
Configured BLE tag monitoring	Licence required	Licence required	4 / 00000010
AirTag-style advertising	Licence required	Licence required	5 / 00000020
Bluetooth relay control	Licence + relay	Licence + relay	6 / 00000040
Phone output-control access	Internal or BLE*	BLE output only*	7 / 00000080
Tilt tamper	Licence required	Licence required	8 / 00000100
Level 3 encryption	Licence required	Licence required	9 / 00000200

* Phone control requires bit 7. A Bluetooth output also requires bit 6 and a supported configured relay; CM107 internal output does not require bit 6. Hardware availability cannot be added by a licence. Masks are hexadecimal; bit positions are zero-based. **000003FF grants all ten current features.** Older 000000FF licences do not grant tilt tamper or Level 3.

No separate licence bit currently assigned

Normal tracking and events; Track mode; continuous calibration; geofencing; offline storage; normal sleep; recovery; GPS diagnostics and supported A-GPS; Level 2 encryption; configuration and firmware update functions. Timed control is included, but its Bluetooth actions inherit the relay licence requirement. Licence installation and status remain available without an advanced-feature grant.

Licensing is application-level feature control, not firmware encryption or a guarantee of secure boot. No prices or commercial bundles are specified here. Higher licence revisions can add or revoke permissions without deleting feature settings. A Level 3 factory reset removes the licence and stored data.