



BINUNLOCK LLC

Professional vehicle diagnostic software

emeOBD

Complete English operating guide

A detailed workshop manual for license activation, BMW gateway discovery, EME identity and software-root reading, EEPROM interpretation, G30 EME ISN reset, normal and shadow DTC work, ECU reset, and evidence export.

ENGLISH · WINDOWS · 12 AUGUST 2026

Qualified service personnel only.

This application can send state-changing commands to a vehicle control unit. Read the safety, preparation, and operation-specific warnings before connecting. Use only with lawful authorization and an approved repair plan.



PUBLICATION

Contents and document control

This manual describes the current clean emeOBD interface and its verified active workflow. The screenshots were generated by the application's deterministic, no-network UI fixture; they contain no live vehicle data.

PRODUCT emeOBD	PUBLISHER BinUnlock LLC
EDITION English · 12 August 2026	OFFICIAL SITE https://binunlock.com/
ACTIVE APPLICATION SCOPE Two windows · 18 user actions	SAFETY CLASS Professional workshop use

01 Scope, authorization, and safety	02 Install, verify, and start
03 Activation and license duration	04 Main workspace
05 Header, theme, status, and menus	06 Network and vehicle preparation
07 Scan Network	08 Select ZGW and automatic Connect
09 Identity and software-root results	10 Open eeprom
11 ISN input and eligibility	12 Run and reset EME ISN
13 Read normal DTC	14 Shadow DTC and ambiguity
15 Erase errors and Reset ECU	16 Save DTC and job records
17 PDF and information actions	18 Complete 18-action reference
19 Recommended end-to-end workflow	20 Troubleshooting

DOCUMENT BOUNDARY

The manual explains the behavior visible in emeOBD. It is not a substitute for current OEM repair information, electrical-safety rules, programming instructions, or a vehicle-specific diagnostic test plan.



CHAPTER 01

Scope, authorization, and safety

emeOBD is a focused BMW G30 EME diagnostic and ISN-reset workspace. It performs only the active operations listed in this manual; it does not replace the complete OEM service process.

What the application does

- Discovers responding BMW central gateways on local IPv4 subnets.
- Reads gateway identity, vehicle VIN, EME VIN, and EME software-root records.
- Parses an approved local EEPROM image for a VIN and supported 16-byte ISN signatures.
- Sends the recovered G30 EME ISN-reset operation.
- Reads catalogue-matched normal and shadow EME DTC entries.
- Sends normal/shadow erase and EME reset commands after their stated confirmation rules.
- Exports the visible DTC list and these two PDF manuals.

What it does not prove or perform

- It does not authenticate an EEPROM file, calculate compatibility, or verify checksums.
- It does not determine whether a replacement unit is legally owned, correct for the car, or safe to install.
- It does not provide high-voltage isolation, removal, soldering, programming, coding, or commissioning instructions.
- It does not validate every diagnostic response as a positive UDS response.
- It does not make a zero-item DTC list equivalent to a confirmed fault-free ECU.
- It does not bypass OEM authorization or security procedures.

HIGH-VOLTAGE AND VEHICLE-MOTION RISK

EME work can be associated with a high-voltage powertrain. Only trained, authorized personnel using current OEM procedures and correctly rated equipment may prepare, isolate, inspect, remove, install, program, or return such a vehicle to service. emeOBD does not establish a safe electrical state.

Operator authorization checklist

- | | |
|---|--|
| ☐ Vehicle owner/work-order authorization recorded | ☐ Vehicle identity independently confirmed |
| ☐ Approved repair plan and OEM service information available | ☐ Workshop safety controls and PPE in force |
| ☐ Stable support power and communication route prepared | ☐ Original diagnostic evidence preserved |
| ☐ Correct source file and replacement part provenance recorded | ☐ Recovery and escalation plan agreed before mutation |

STOP RULE

If the vehicle, selected gateway, EME identity, source file, or authorization is uncertain, do not use Reset ISN, Erase Errors, Erase shadow, or Reset ECU.



CHAPTER 02

Install, verify, and start

Prepare a known, supported Windows workstation before connecting it to a vehicle network. Never solve a start-up warning by downloading unrelated components or disabling workshop security controls.

Windows

Use the supported 64-bit or 32-bit Windows environment defined by your workshop release policy.

.NET 4.8

The application targets Microsoft .NET Framework 4.8.

x86

The application executable is built for the 32-bit Windows process architecture.

Recommended installation sequence

- 1 Obtain the complete current release through the BinUnlock distribution channel. Do not combine files from different versions.
- 2 Before first launch, inspect the executable's Windows **Properties** → **Digital Signatures**. The expected publisher is **BinUnlock LLC**. Stop if the signature is absent, invalid, or names another publisher.
- 3 Install or extract to a local folder permitted by workshop policy. Ensure the user can read the application and write to the selected report/export folders.
- 4 Confirm .NET Framework 4.8 is enabled. Apply normal Windows servicing updates and restart if required.
- 5 Disconnect from the vehicle while completing initial start-up and activation. This prevents an accidental operation during setup.
- 6 Start **emeOBD.exe**. If no valid license is available, the activation window appears before the main workspace.

IDENTITY CHECK

The application window and taskbar use the emeOBD battery/diagnostic icon. The small green BinUnlock favicon inside the interface is a separate official website link. Clicking it opens only <https://binunlock.com/> in the default browser.

Workstation preparation

Item	Required condition	Why it matters
Date and time	Correct Windows UTC/local time; automatic synchronization preferred.	Timed licenses and trusted-time protection depend on a coherent clock.
Network	Vehicle adapter enabled with a valid IPv4 address and subnet mask.	Discovery calculates a directed broadcast for each local IPv4 address/mask pair.
Competing tools	Close software that may hold the same vehicle diagnostic session or network route.	Competing sessions can cause silence, stale data, or timeouts.
Power	Vehicle support power established under the applicable repair plan.	Control-unit resets and network operations must not be interrupted by voltage collapse.



CHAPTER 03

Activation and license duration

A license is signed for one computer and one customer. The application validates it before constructing vehicle transports and again at the start of every protected operation.

01

Copy HWID

In the activation window, review the Reason, then select **Copy HWID**. Send the 32-character identifier only through the approved BinUnlock licensing channel.

02

Choose duration

Request exactly one offered term: **10 days**, **30 days**, or **Never**. The chosen term is set when BinUnlock issues the license.

03

Install and Retry

Use **Install** to select the received license, then **Retry**. On success the main workspace opens and shows the registered customer and expiry.

Activation action	Effect	Operator note
Copy HWID	Copies this computer's stable identifier to the Windows clipboard.	Re-copy after a hardware/Windows change if the existing license reports another computer.
Install	Validates the selected signed license before storing it for the current user.	A malformed, expired, wrong-product, or wrong-HWID file is rejected rather than installed.
Retry	Runs license validation again.	Use after installing a license or correcting workstation time.
Exit	Closes the application without activation.	No vehicle transports are created.

Duration and expiry display

10 DAYS

Timed license

Valid until its signed UTC expiry. It becomes invalid at the exact expiry instant.

30 DAYS

Timed license

Same validation rules, with the longer signed term.

NEVER

Perpetual display

The main header shows **Never**. Computer binding and signature checks still apply.

DO NOT EDIT OR SHARE THE LICENSE

The license authenticates the product, customer, HWID, issue time, expiry, and protected content access. Manual edits invalidate it. Do not publish the license or screenshots containing customer/HWID information.

CLOCK PROTECTION

A materially future-dated license, an expired license, or detected clock rollback fails closed. Correct the Windows clock and contact BinUnlock if the trusted-time message remains; do not roll the clock backward.



CHAPTER 04

Main workspace

The responsive main window groups connection and G30 EME reset work on the left, readouts and DTC work on the right, and live operation status along the bottom.

Synthetic UI fixture · light theme · no network or vehicle connection. The fixture uses documentation-only customer text and a perpetual **Never** expiry.

- 1 Header:** product, registered customer, expiry, BinUnlock link, theme.
- 2 ZGW:** scan, IP entry, connect, identity, connection status.
- 3 G30 EME reset:** local EEPROM VIN/ISN and reset action.
- 4 Software roots:** parsed BTLD/SWFL/HWEL and related records.
- 5 EME DTC:** normal/shadow reads, erases, reset, save.
- 6 Documents:** exports the two current BinUnlock PDFs.
- 7 Status bar:** current operation, completion, or full error message.
- 8 About menu:** registered user, developer, and Exit.

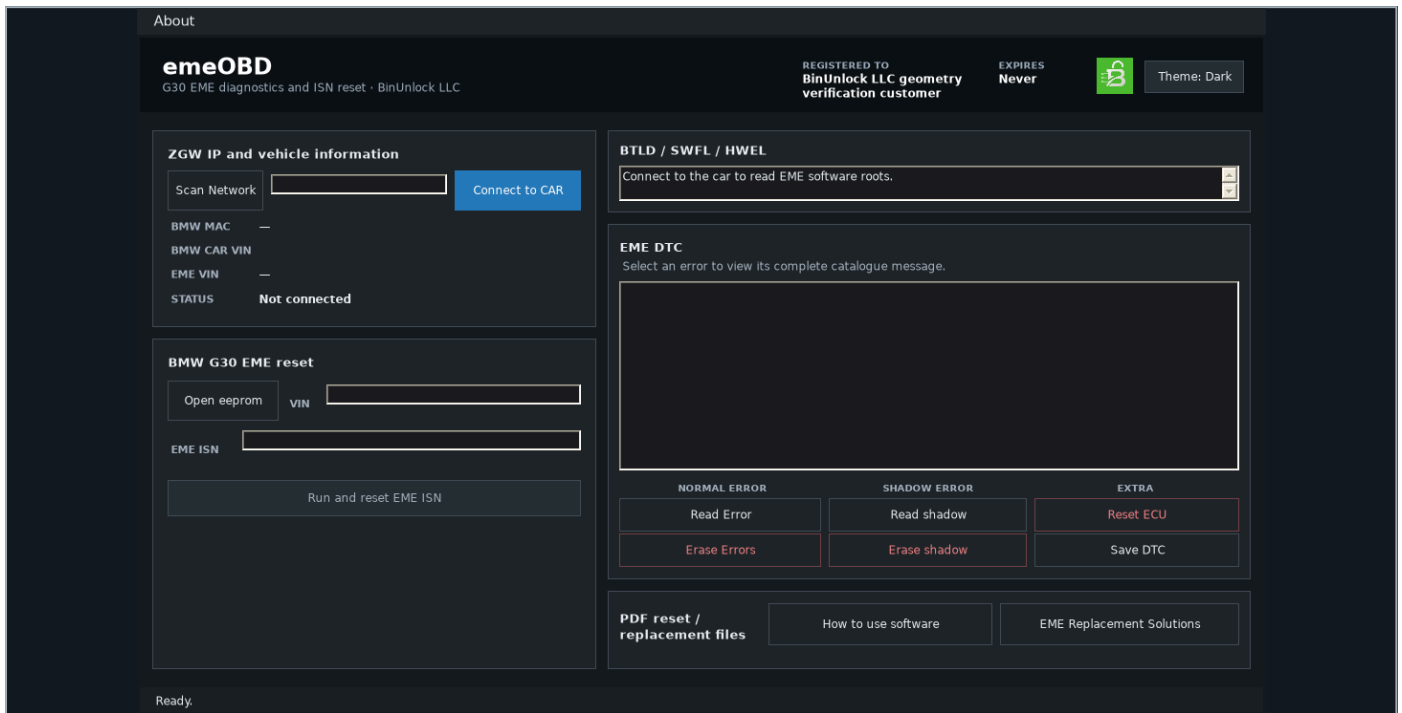
ONE OPERATION AT A TIME

While a protected action is running, another action is not started. Closing the main or discovery window is blocked until the current deterministic operation reaches its terminal state. Do not terminate the process to shorten a timeout.



CHAPTER 05

Header, theme, status, and menus



Synthetic UI fixture · dark theme. All visible text and controls use the same active theme; the application remembers the choice for the current Windows user.

Element	Meaning and use
REGISTERED TO	Customer name authenticated by the active license. Use About → Registered user to see it in a dialog.
EXPIRES	Signed expiry display. A perpetual license shows Never ; a timed license shows its expiry.
Green favicon	Keyboard-accessible link to the official site. Click it or focus it and press Enter/Space. It opens https://binunlock.com/ .
Theme: Light / Dark	Switches every open emeOBD window immediately and stores the selected theme.
STATUS identity row	Shows Not connected initially and Connected after the connect workflow returns identity data.
Bottom status bar	Shows the active step, count, saved destination, completion text, or complete failure text. Read it before starting another action.
About → Developer	Displays product scope and BinUnlock LLC authorship.
About → Exit	Closes the application only when no operation is still running.

WINDOW SCALING

The main window has a compact minimum size and dynamically uses additional space when maximized. At 125% or 150% Windows scaling, maximize the window if you want the largest DTC list and software-root area.

DISPLAY CHANGES DO NOT TOUCH THE VEHICLE

Theme switching, favicon navigation, menu information, window sizing, and license-header display do not send a vehicle request.



CHAPTER 06

Network and vehicle preparation

Discovery and diagnostic traffic use the workstation's IPv4 route to the BMW central gateway. Prepare the physical vehicle state and Windows network before pressing Scan Network.

- 1 Identify the vehicle independently from the work order, physical VIN, and approved diagnostic system. Record the intended EME task.
- 2 Establish vehicle support power, ignition/wake state, and safe workshop conditions exactly as required by current OEM information.
- 3 Connect the approved diagnostic Ethernet interface. Confirm Windows reports a live link and an IPv4 address with a subnet mask.
- 4 Disable or route around VPNs, virtual adapters, Internet sharing, and firewall policies only through approved IT procedure. Never weaken unrelated security controls.
- 5 Close other diagnostic programs that could use the same gateway or EME session.
- 6 Start emeOBD and confirm the licensed customer/expiry, selected theme, and **Ready.** bottom status.
- 7 Keep the vehicle stationary and prevent unauthorized access. Do not begin a mutation while programming, charging changes, sleep/wake transitions, or another repair operation is active.

Discovery behavior that affects preparation

Behavior	Operator consequence
One directed broadcast per enumerated local IPv4 address/mask	Extra adapters may add scan delay or send discovery onto an unintended local subnet. Use a controlled workstation network configuration.
UDP destination port 6811	Local firewall and adapter policy must permit the application and response traffic.
500 ms receive timeout per subnet	A slow or sleeping gateway may not appear. There is no automatic retry pass.
No de-duplication of subnet destinations	Duplicate Windows address/mask entries can cause repeated discovery attempts; duplicate display rows are still suppressed.
Manual host accepts any nonempty trimmed text	Typing errors are delegated to Windows networking. A nonempty string is not proof of a valid or correct vehicle address.

EXPECTED NETWORK

The application skips the placeholder address `0.0.0.0`. For an address such as `192.168.10.42` with mask `255.255.255.0`, its directed discovery destination is `192.168.10.255`.

NO LIVE TESTING BY GUESS

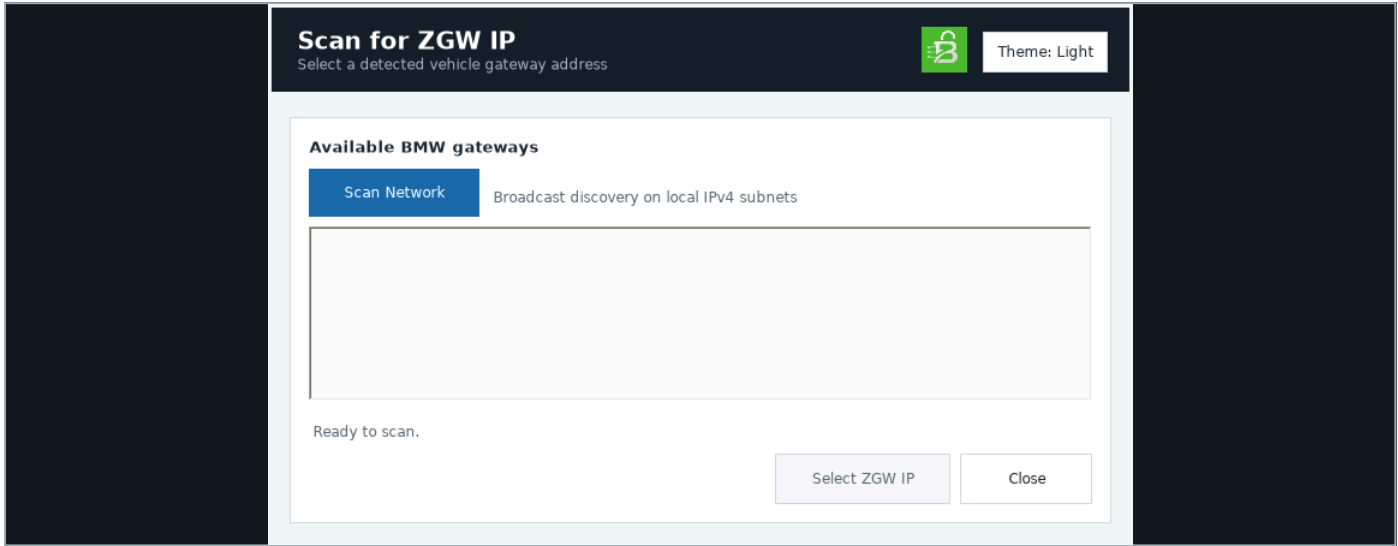
Do not enter arbitrary IP addresses or repeat reset/erase operations merely to test connectivity. Use discovery, identity, and an approved diagnostic plan to establish the correct endpoint.



CHAPTER 07

Scan Network

The main **Scan Network** action opens the modeless gateway window. Scanning inside that window sends the six-byte discovery request and lists only responses containing the expected VIN marker.



Synthetic no-network fixture. Existing result rows are retained and only unseen exact display rows are added. Scan is busy; **Select ZGW IP** is not disabled at scan start. Status ends with the count or an error.

- 1 In the main window select **Scan Network**. The discovery window opens without disabling the main form.
- 2 Confirm the hint **Broadcast discovery on local IPv4 subnets**, then select the discovery window's **Scan Network**.
- 3 Wait until the pointer and controls return to normal. Do not close either window during the active scan.
- 4 Review each row in the form (`<peer IP>`) - `<VIN>`. Compare the displayed VIN with the physical vehicle and work order.
- 5 If the expected gateway is present, highlight that row and select **Select ZGW IP**. The handler copies the peer IP to the main ZGW field, closes/hides the scan window, and automatically invokes the main **Connect to CAR** action. Wait for that connection workflow to finish. If the expected gateway is absent, troubleshoot instead of choosing a different car.

What a row means

A row is produced when a positive-length UDP response contains the literal marker `BMWVIN`. emeOBD takes up to 17 characters after that marker and uses the response peer IP for the address inside parentheses. Duplicate display rows are suppressed.

The scan does not cryptographically authenticate the responder and does not prove that the displayed text is the physical vehicle. Independent identification remains mandatory.

Visible result	Next step
No BMW ZGW responses were found.	Check vehicle wake state, physical link, IPv4 address/mask, firewall, VPN/virtual adapters, and competing tools. Then scan once more.
One correct VIN	Select the verified row. The IP is copied, the scan window closes/hides, and the main Connect to CAR action starts automatically.
Multiple rows	Choose only the row whose VIN and workshop bay are independently confirmed.
Unexpected/partial VIN	Stop. Capture the row and network state; do not use it for mutations.



CHAPTER 08

Select ZGW and automatic Connect

Select ZGW IP is a chained route. Any valid current **BMWVIN** response enables the button regardless of whether a row is highlighted. A click first validates the highlighted row: with no highlighted row it shows the selection-required dialog and does not continue; with a valid selection it copies the peer address into the main ZGW field, closes/hides the scan window, and dynamically invokes the main **Connect to CAR** button. The three-stage connection workflow therefore starts automatically after the scan window closes.

A

Gateway identity

One unicast UDP request to the chosen host on port 6811. The response is searched for BMW MAC and BMW VIN text. Receive timeout: 5000 ms.

B

Software roots

A shared TCP connection to port 6801 sends the EME software-root request and parses recognized records after the fixed collection timing.

C

EME VIN

A second request on TCP/6801 collects until the buffer is stable or the total collection window ends, then displays up to the final 17 response bytes.

Two supported ways to start

Method	Procedure	Important detail
Discovered gateway	Highlight a verified row and select Select ZGW IP , then wait for the automatically invoked connection workflow.	The handler copies the peer IP, closes/hides the scan window, then invokes the main Connect click route; observable network I/O begins in that chained Connect action.
Manual address	Type/paste the known gateway host into the ZGW field and select Connect to CAR .	Leading/trailing characters at or below U+0020 are trimmed. Only an empty result is rejected; syntax is not pre-validated.

Connection timing and interpretation

- The identity stage sends once and does not retry.
- The shared diagnostic client uses 2000 ms connect and read timeouts.
- The software-root stage waits 1000 ms before checking buffered data; a zero-byte result stops before the EME VIN stage.
- The EME VIN stage has a buffer-growth collection loop: it stops after 120 ms stable or 3000 ms total.
- There is no automatic reconnection retry inside a single Connect action.

IDENTITY GATE

Do not continue to any state-changing operation until the displayed BMW CAR VIN, EME VIN, gateway context, and physical vehicle have been reconciled. A regex miss may leave BMW MAC/VIN blank even when later stages continue.

SELECT CHAINS INTO CONNECT

A valid current **BMWVIN** response enables **Select ZGW IP**; highlighting is not what enables it. Clicking without a highlighted row shows the selection-required dialog. Clicking with a valid highlighted row copies the peer IP, closes/hides the scan window, and programmatically invokes **Connect to CAR**. Do not click the main Connect button again while that automatic workflow is running.



CHAPTER 09

Identity and software-root results

A completed connection populates four identity rows and the BTLD/SWFL/HWEL panel. Treat them as independent evidence: one populated field does not guarantee that every stage succeeded.

Visible field	Source and parser behavior	Operator use
BMW MAC	Text captured between BMW MAC and BMW VIN in the UDP identity response. The wildcard does not cross Unicode newline sequences.	Record as supporting gateway identity. A blank field requires investigation.
BMW CAR VIN	Text captured after BMW VIN by the same identity pattern and trimmed.	Compare with physical VIN and work order before mutation.
EME VIN	Up to the last 17 bytes of the final VIN response. Printable ASCII is shown; other bytes become ?.	Compare with expected ECU/vehicle state. Question marks or partial text are not a pass.
STATUS	Initially Not connected ; updated to Connected when the application service returns an identity result.	Use with—not instead of—the individual identity fields.
BTLD / SWFL / HWEL	Recognized 8- or 9-byte records in the complete software-root response. Known labels also include HWAP, HWFR, CAFD, SWFF, SWPF and related record types.	Save or transcribe the complete list for compatibility/recovery records.

Software-root output

Records are scanned byte by byte. Recognized entries are formatted as a type label, identifier, and version components. Unrecognized bytes are skipped rather than rendered. If no record is recognized, the connect workflow reports that the EME was not detected and does not proceed to the EME VIN request.

GOOD EVIDENCE SET

Correct physical VIN + expected ZGW peer + BMW CAR VIN + plausible EME VIN + nonempty software roots + stable connection status.

STOP CONDITIONS

No response, empty roots, mismatched VIN, unexpected peer, question-mark VIN, timeout, or any connection exception.

After a connection error

1. Copy the complete bottom status/error text.
2. Do not immediately run a mutation.
3. Verify power, wake state, selected IP, adapter route, and competing sessions.
4. Rescan and reconnect once the cause is corrected.
5. Re-confirm all identity fields; do not assume the previous selection remains valid after network changes.



CHAPTER 10

Open eeprom

Open eeprom is a local-file action. Its click clears the visible EEPROM VIN and EME ISN fields before the picker opens. For a selected file, it checks the length before reading the complete binary, then extracts a VIN candidate, searches supported signatures, and updates the EME ISN/reset state. It does not contact the vehicle.

Before opening a file

- ☐ Preserve an immutable original dump
- ☐ Calculate/store the file hash in the work order
- ☐ Confirm authorization for the source data
- ☐ Record source unit and read method
- ☐ Use a working copy for analysis
- ☐ Close tools that could still be writing the file

- 1 Select **Open eeprom**. emeOBD immediately clears the visible EEPROM VIN and EME ISN fields, then opens the picker for **Binary files (*.bin)** or all files.
- 2 If you cancel, no file work is performed, but the two fields remain blank because they were cleared before the picker opened.
- 3 If you select the intended binary, emeOBD checks its exact length before reading its content.
- 4 If the length is accepted, the complete file is searched first for a VIN prefix and independently for the supported ISN signatures.
- 5 Read the bottom status, visible VIN, visible EME ISN text, and reset-button state as separate outputs.

Only these file lengths are accepted

0x80000

524,288 bytes · 512 KiB

0xC0000

786,432 bytes · 768 KiB

0xD4000

868,352 bytes · 848 KiB

VIN extraction

The byte data is searched in strict prefix priority: **WBA**, then **WMW**, then **5UX**. At the first hit for the first available prefix, up to 17 characters are copied from that position. A hit close to end-of-file may be shorter. If no prefix is found, the field shows **VIN not found in the file!**

PARSER OUTPUT IS NOT AUTHENTICATION

The parser does not validate a file checksum, internal structure, provenance, VIN check digit, vehicle match, or software compatibility. A displayed 17-character string is a candidate extracted by a simple search.

UNSUPPORTED SIZE

An incorrect length stops parsing and displays an error. Do not pad, truncate, concatenate, or otherwise alter a dump merely to make its size accepted.



CHAPTER 11

ISN input and reset eligibility

The EEPROM signature determines what appears in **EME ISN** and whether the application explicitly enables or disables the reset button. Review the exact branch—never infer eligibility from button color alone.

Kind 1 • disabled

28 17 00 00 00 00 00 00

Displays **The F series does not have EME ISN in MDG1** and disables Reset ISN.

Kind 2 • disabled

17 28 00 00 FF FF

Displays the same F-series message and disables Reset ISN.

Kind 3 • enabled

83 6A 00 00, with the next two bytes not both zero

Extracts exactly 16 bytes beginning 45 bytes after the signature and renders 32 uppercase hex characters.

Kind 4 • enabled

6A 02 00 00 FF FF

Extracts exactly 16 bytes beginning 61 bytes after the signature and renders 32 uppercase hex characters.

Search rules that matter

- The parser tests the four kinds in the order above at every candidate offset.
- It scans only through `Length - 200`. A signature in the final 199 bytes is intentionally ignored.
- The first matching signature wins.
- If no signature matches, an error is reported but the code does not explicitly change the previous Reset ISN enabled/disabled state.
- The reset button starts disabled when a fresh main window is created. Only a supported Kind 3/4 result enables it.

STALE ENABLED-STATE HAZARD

Because a no-signature file preserves the previous button state, an enabled **Run and reset EME ISN** button is not proof that the current file produced a valid ISN. Proceed only when the current open operation visibly returned the expected 32-character ISN and the file/vehicle were independently verified.

Data accepted by the reset decoder

Input property	Actual behavior	Operator rule
Spaces	Only ASCII space characters are removed.	Use the unedited 32-character output from a verified Kind 3/4 parse.
Length	Pairs are decoded using <code>floor(length / 2)</code> ; an odd final nibble is ignored.	Do not type, shorten, or append data manually.
Empty text	Produces no suffix if a previously enabled session state makes the action reachable; a fresh window starts with the button disabled.	Never run with an empty or dash-only visible field.
Invalid pair	Raises an error into the outer operation failure path.	Return to the source file; do not “repair” the value by guess.



CHAPTER 12

Run and reset EME ISN

This is the most consequential emeOBD action. It opens a new TCP connection to the selected ZGW host on port 6801 and sends one write request. The current interface does **not** display a confirmation dialog before dispatch.

THE BUTTON IS THE COMMIT POINT

Selecting **Run and reset EME ISN** starts the operation immediately. It does not run the shared nonempty/trimmed-host check. Perform every verification below before the click. Do not click it to test communication.

Mandatory pre-click gate

- | | |
|--|--|
| ☐ Lawful authorization and approved repair step | ☐ Correct physical vehicle and workshop bay |
| ☐ Correct ZGW IP from a fresh scan/connect | ☐ BMW CAR VIN and EME VIN reconciled |
| ☐ Source EEPROM provenance and hash recorded | ☐ Accepted length and expected Kind 3/4 parse |
| ☐ Exactly 32 visible uppercase hex characters | ☐ Stable support power and network path |
| ☐ No competing diagnostic/programming session | ☐ Recovery/escalation plan ready |

Exact active transaction

- 1 The application creates a separate TCP client with 2000 ms connect/read timeouts and assigns the ZGW field text verbatim as host. Empty, whitespace-only, or malformed text reaches the socket/error branch.
- 2 It builds a fixed request for data identifier `C001` with subfunction/data byte `07`, then appends every decoded ISN byte.
- 3 With the normal 32-character EEPROM result, 16 decoded bytes are appended and the complete transmitted frame is 28 bytes.
- 4 The request is sent once. There is no retry, seed/key exchange, SecurityAccess service, or challenge calculation in this active path.
- 5 The client performs an LF-oriented line read, then consumes the remaining available response bytes.
- 6 Definite success is reported only if the final two remaining bytes are `C0 01`. Any other nonexceptional response uses the “Possible that the EME ISN is reset” warning result.

Normal data transformation
32 hex characters from EEPROM → 16 bytes
fixed write prefix + 16 bytes → one 28-byte request
response final bytes `C0 01` → definite-success branch

NO MID-OPERATION CANCELLATION

Once dispatched, the UI waits for the deterministic terminal result. A close request is blocked. Keep power and communication stable and let the configured timeout/error path complete.



CHAPTER 12 • CONTINUED

ISN reset outcomes and recovery

An application message is only one item of post-operation evidence. A communication-level success does not prove that the complete vehicle replacement/commissioning process is finished.

Outcome	What it actually means	Required response
Definite-success message	The final remaining response bytes were exactly C0 01 .	Record the message/time, allow the network to settle, reconnect, read identity and both DTC memories, then continue the approved OEM process.
“Possible that the EME ISN is reset”	A nonexceptional response completed, but its final bytes did not meet the definite-success test.	Do not repeat automatically. Preserve the result, reconnect, diagnose state, and decide through the repair plan.
Connection/parse/I/O error	The operation entered the outer error path. The message does not establish whether the control unit applied any part of the request.	Keep power stable, capture the full error and timestamp, inspect network/ECU state, and seek an approved recovery decision before any retry.
Application appears busy	The transaction or configured timeout has not yet ended.	Wait. Do not terminate the process, disconnect the adapter, cycle support power, or press other actions.

Post-operation verification

- 1 Wait for the bottom status and message dialog to reach a final state.
- 2 Record the exact text rather than paraphrasing “worked” or “failed.”
- 3 Allow the EME and gateway to complete any reset/settling period required by the repair plan.
- 4 Run a fresh network scan if the previous session disappeared.
- 5 Reconnect and verify BMW CAR VIN, EME VIN, and software roots.
- 6 Read normal DTC and save a dated report.
- 7 Read shadow DTC and save a separate dated report.
- 8 Perform any required OEM programming, coding, authorization, commissioning, and functional checks outside emeOBD.
- 9 Do not return the vehicle to service until every safety and functional gate is passed.

NO BLIND RETRY

A timeout or ambiguous response can occur after the ECU has received the request. Repeating a state-changing action without first determining current state can make recovery harder.

SUPPORT EVIDENCE

Keep the full VIN context, selected ZGW IP, EEPROM hash/length, displayed ISN, action time, complete result/error text, power/network conditions, software roots, and before/after DTC exports. Remove customer-identifying data before sharing beyond the authorized support case.



CHAPTER 13

Read normal EME DTC

Read Error sends one normal-memory request through the shared TCP diagnostic connection. On the read-complete path, emeOBD shows the completion message and rebuilds the visible list as a structured legacy report—not as catalogue rows alone.

- 1 Verify the correct ZGW address and complete a fresh identity connection.
- 2 Select **Read Error** under **NORMAL ERROR**.
- 3 Wait through the fixed 2000 ms collection delay and the additional data check. Do not start another operation.
- 4 Review the bottom count and every line of the visible report: header, result body, EME address, current CAR VIN, and footer.
- 5 Before erasing anything, select **Save DTC** and keep a dated “Before” report.

Visible report layout · normal and shadow

Order	Exact report content
1	A separator containing exactly 90 hyphen characters.
2	NORMAL ERRORS FOUND: (count) or the recovered shadow spelling SHADOWN ERRORS FOUND: (count) , followed by another 90-hyphen separator.
3	(NO DTC) when count is zero; otherwise every matched catalogue row in catalogue order.
4	A 90-hyphen separator, then EME address: 0x3A for normal or EME address: 0xA3 for shadow.
5	The current visible BMW CAR VIN, then Normal errors! or the recovered spelling Shadown errors! .
6	A final separator containing exactly 90 hyphens.

SAVE PRESERVES THE VISIBLE REPORT

Save DTC saves every currently visible report line in exactly this order, including separators, count header, **(NO DTC)** or matches, EME address, current CAR VIN, and footer.

How catalogue matching works

01

Collect bytes

The input buffer is read as available after the configured wait/check. There is no diagnostic-envelope or positive-response validation step.

02

Make hex text

Every byte becomes two uppercase hexadecimal characters with no separators.

03

Search 713 keys

The first six characters of each catalogue row are searched anywhere in that complete text. Every matched row is listed once.

CATALOGUE VIEW, NOT A FULL DIAGNOSTIC DECODER

There is no envelope/status validation. Keys can match headers, padding, odd hex-character positions, or across byte boundaries; each key is listed at most once. Confirm every visible match with an approved diagnostic system and vehicle-specific test plan.



CHAPTER 14

Shadow DTC and result ambiguity

Read shadow uses a different request but the same timing, complete-response hexadecimal conversion, and 713-key substring search. It rebuilds the same structured report shape with the recovered shadow labels and EME address 0xA3.

- 1 Complete the same identity and network checks used for a normal read.
- 2 Select **Read shadow** under **SHADOW ERROR**.
- 3 Wait for the operation to finish and review the complete list.
- 4 Save it to a filename that clearly says **Shadow** and **Before** or **After**.
- 5 Interpret normal and shadow memory separately. A clean-looking normal list does not replace a shadow read.

Why a zero-count report is ambiguous

Possibility A

Bytes were collected, but none of the 713 six-character catalogue keys appeared in the complete response text.

Possibility B

The collected response was empty/silent, or a post-connect I/O failure was absorbed by the recovered read path. The read-complete modal may still appear and the report may show count zero with (NO DTC).

ZERO COUNT ≠ PROVEN RESPONSE OR FAULT-FREE

Neither a read-complete message nor a structured report containing (NO DTC) proves that the ECU returned valid diagnostic data. Silence and a post-connect I/O failure can produce that same visible zero-count report.

Interpretation rules

Observation	Safe interpretation	Next evidence
One or more catalogue rows	The six-character keys appeared somewhere in the complete received hex text.	Save the list; read with the approved diagnostic system and follow the fault test plan.
Count 0 + (NO DTC) + read-complete modal	No key was listed; silence or an absorbed post-connect I/O failure remains possible.	Verify endpoint and response with another authorized diagnostic method.
Connection failure before the shared connection is established	The earlier visible report may remain while the bottom status shows an error.	Do not save it as the current read; correct communication first.
Unexpected sentinel/padding-like row	Could be a substring match outside a formal DTC record.	Cross-check raw diagnostic evidence through approved tooling.

Before versus after

Always save both normal and shadow lists before a mutation. After a reset, erase, ISN reset, programming, or replacement step, reconnect and save new files. Never overwrite the only “Before” evidence.



CHAPTER 15

Erase errors and Reset ECU

These three actions are state-changing. Each displays a Yes/No confirmation, sends once through the shared TCP connection, waits, reads/discards one LF-terminated line, and reports completion when no exception occurs.

Action	Confirmation	Scope	Afterward
Erase Errors	"Erase normal EME errors?"	Normal EME diagnostic memory request.	Reconnect if needed, then run Read Error and save a new After report.
Erase shadow	"Erase shadow EME errors?"	Shadow EME diagnostic memory request.	Run Read shadow and save a separate After report.
Reset ECU	"Reset the EME ECU now?"	EME ECU reset request.	Allow reboot, rediscover/reconnect if necessary, verify identity and both memories.

Common transaction behavior

- 1 The action continues only if you select **Yes**.
- 2 emeOBD verifies that the ZGW field is nonempty, connects/reuses the shared TCP diagnostic client on port 6801, and clears its input buffer.
- 3 The action-specific frame is written once.
- 4 The workflow waits 2000 ms, checks for data, performs one LF-oriented read, and discards that text.
- 5 If no exception is raised, the operation returns its success message. Response content is not checked for a positive service code.

SUCCESS MESSAGE BOUNDARY

For these three commands, "success" means the configured send/wait/read sequence completed without an exception. It does not mean that emeOBD parsed or validated a positive ECU response, and it does not prove the intended vehicle state.

When to erase

- Only after saving the complete Before normal and shadow lists.
- Only when the approved fault test plan calls for an erase at that point.
- Only after underlying electrical, communication, installation, and programming causes have been corrected.
- Never as a substitute for diagnosis, to hide unresolved faults, or merely to see whether they return.

When to reset the ECU

- Use only when required by the authorized workflow and the vehicle is in a safe supported state.
- Expect temporary communication loss. Do not send other requests while the EME restarts.
- If the gateway/EME disappears, wait for boot, scan again, confirm the correct VIN, and reconnect.



CHAPTER 16

Save DTC and job records

Save DTC writes every line currently visible in the EME DTC list exactly as shown. A completed read normally leaves a structured legacy report containing separators, memory/count header, (NO DTC) or matches, EME address, current CAR VIN, and footer. Save does not run a fresh read or add a timestamp.

- 1 Immediately after the intended read, review the list and bottom status.
- 2 Select **Save DTC**. The default name is `3A.txt` and the filter is **DTC file (*.txt)**.
- 3 Choose a writable job folder and replace the generic name with a descriptive, unique filename.
- 4 After the save completes, verify the bottom status shows the chosen destination.
- 5 Open the file read-only and confirm its content/count before clearing or replacing the visible list.

Exact file format

Property	Output
Encoding	Windows active ANSI code page. Built-in labels/catalogue text are 7-bit ASCII; the current CAR VIN line is converted through that active code page.
Byte-order mark	None.
Line ending	CRLF (0D 0A).
Final line	A CRLF follows every row, including the last.
Literally empty visible list	Creates a zero-byte file. A completed zero-count read is different: its visible structured report is nonempty and includes (NO DTC).
Existing target	Replaced/truncated after the user accepts the save destination.

Recommended naming

```
<VIN>_Normal_DTC_Before_YYYYMMDD_HHMM.txt  
<VIN>_Shadow_DTC_Before_YYYYMMDD_HHMM.txt  
<VIN>_Normal_DTC_After_YYYYMMDD_HHMM.txt  
<VIN>_Shadow_DTC_After_YYYYMMDD_HHMM.txt
```

Minimum job record

- | | |
|--|---|
| ☐ Vehicle/work-order identity | ☐ Operator and authorization |
| ☐ Application release/signature check | ☐ License customer/expiry display |
| ☐ ZGW IP and identity fields | ☐ Software-root list |
| ☐ EEPROM source, length, and hash | ☐ Every mutation and exact result text |
| ☐ Before/After normal DTC files | ☐ Before/After shadow DTC files |

DATA HANDLING

VINs, HWIDs, licenses, and diagnostic reports can be customer/workshop-sensitive. Store and share them only under the applicable work-order, privacy, and retention policy.



CHAPTER 17

PDF and information actions

The document buttons export clean BinUnlock manuals through a Save dialog. The About menu provides local product/license information. None of these actions sends vehicle traffic.

Action	Dialog default · no extension	Result
How to use software	How to use	The application appends <code>.pdf</code> , producing <code>How to use.pdf</code> with the default base name.
EME Replacement Solutions	Document of EME	The application appends <code>.pdf</code> , producing <code>Document of EME.pdf</code> with the default base name.
About → Registered user	None	Shows registered customer and license expiry in an informational dialog.
About → Developer	None	Shows emeOBD purpose and BinUnlock LLC authorship.
About → Exit	None	Closes the main window if no operation is active.
BinUnlock favicon	None	Opens https://binunlock.com/ in the default browser.
Theme: Light / Dark	Current-user preference	Changes and persists the UI theme across both windows.

Export procedure

- 1 Select the required PDF button in the **PDF reset / replacement files** card. A pre-warning says **Save PDF and read carefully!!!**; acknowledge it to reach the Save dialog.
- 2 The dialog default is an extension-free base name and the filter is **Terms of use (*.pdf)**.
- 3 Choose a writable folder and type a base name only—without `.pdf`. The application unconditionally appends `.pdf`; entering the extension yourself produces a doubled name such as `How to use.pdf.pdf`.
- 4 Accept the dialog and wait for the success message/status containing the final appended path.
- 5 Open the saved copy in a trusted PDF viewer and confirm the title, BinUnlock branding, page count, and current edition date.

PORTABLE MANUALS

The exported PDFs contain embedded fonts, internal contents links, and document bookmarks. The only external website link in either manual is the official BinUnlock address.

KEEP THE PAIR TOGETHER

This operating guide explains the application controls. **Document of EME.pdf** explains the responsible replacement/EEPROM decision workflow and explicitly excludes hazardous physical repair instructions.

If export fails

- Choose a writable local folder rather than a disconnected network drive.
- Close any PDF viewer that holds the same target file with an exclusive lock.
- Enter a base name without `.pdf`; the application adds the extension itself.
- Read the complete bottom status/error message and preserve it for support.



CHAPTER 18

Complete 18-action reference · 1-10

The active application has exactly 18 user actions: 15 in the main workspace and 3 in the gateway window. Display-only theme/favicon controls are useful but are not part of that recovered action count.

1	Scan Network Main	NAVIGATION	Opens the modeless gateway discovery window. This main-window action itself sends no network traffic.
2	Connect to CAR	READ	Runs gateway identity over UDP/6811, then EME software roots and EME VIN over TCP/6801.
3	Open eeprom	LOCAL FILE	Accepts only 512/768/848 KiB binaries; extracts a VIN candidate and supported ISN signature result.
4	Run and reset EME ISN	WRITE	Immediately sends one C001 write with decoded ISN bytes. No confirmation; definite success requires final response bytes C0 01.
5	Read Error	READ	Reads normal EME memory, searches 713 keys, then builds the structured normal report with count, matches or (NO DTC), address, current CAR VIN, and footer.
6	Erase Errors	WRITE	After Yes confirmation, sends the normal-memory erase request once; response content is not positively validated.
7	Read shadow	READ	Reads shadow EME memory using the same parser and builds the corresponding structured shadow report.
8	Erase shadow	WRITE	After Yes confirmation, sends the shadow-memory erase request once; verify by a later read.
9	Reset ECU	CONTROL	After Yes confirmation, sends one EME ECU reset request; expect temporary loss of communication.
10	Save DTC	LOCAL FILE	Saves every currently visible report line in order as ANSI text with CRLF after every item; only a literally empty list creates a zero-byte file.

ACTION CLASS

READ contacts the vehicle without intending to change state. **WRITE / CONTROL** may change state.
LOCAL FILE reads or writes workstation files only.



CHAPTER 18 · CONTINUED

Complete 18-action reference · 11-18

11	How to use software	EXPORT	Shows the PDF pre-warning, opens with base name How to use , then unconditionally appends .pdf .
12	EME Replacement Solutions	EXPORT	Shows the PDF pre-warning, opens with base name Document of EME , then unconditionally appends .pdf .
13	Registered user	INFO	Shows the current license customer and expiry. No vehicle or file operation.
14	Developer	INFO	Shows emeOBD scope and BinUnlock LLC authorship.
15	Exit	NAVIGATION	Closes the main form. When an operation is running, closing is blocked until it finishes.
16	Scan Network Gateway window	DISCOVERY	Sends one UDP/6811 request to every calculated directed IPv4 subnet broadcast and collects one receive opportunity per destination.
17	Select ZGW IP	SELECTION	Any valid current BMWVIN response enables it, even without a highlighted row. A click with no selection shows the selection-required dialog; a valid selection copies its peer address, closes/hides the gateway window, then dynamically invokes the main Connect to CAR click route. That chained action starts network I/O automatically.
18	Close Gateway window	NAVIGATION	Hides/closes the discovery window without selecting a gateway. During a scan, close is blocked until scanning finishes.

Not counted as active actions

Element	Why it is separate
Theme toggle	Modern display preference added for the current UI; it sends no vehicle traffic.
BinUnlock favicon	Modern website link fixed to the official BinUnlock address.
Window maximize/minimize/resize	Standard responsive Windows behavior.
Activation controls	Startup license workflow, before the protected application transport is available.

DO NOT INFER A 19TH VEHICLE FUNCTION

Only the 18 actions above are in shipping scope. Historical resource residue or unbound code does not authorize additional operations.

Close behavior

When idle, the scan window is reusable and may be hidden/reopened. When discovery or a vehicle operation is active, emeOBD shows a wait message and refuses to close. This protects atomic send/read/timing behavior from being split by user cancellation.



CHAPTER 19

Recommended end-to-end workflow

This sequence keeps read-only evidence ahead of state-changing work. Adapt it only through the vehicle's approved repair plan; emeOBD does not determine whether a mutation is required.

01

Authorize

Confirm work order, owner authorization, qualified personnel, safety boundaries, and recovery plan.

02

Prepare

Stable support power, correct wake state, approved adapter, controlled IPv4 route, no competing sessions.

03

Identify

Scan and select the verified VIN; the route copies the IP, closes/hides Scan, and automatically runs Connect. Wait, then reconcile gateway/vehicle/EME identity plus roots.

04

Capture Before

Read and save normal DTC, then read and separately save shadow DTC.

05

Prepare local data

Hash and preserve EEPROM source; open working copy; verify accepted size, VIN candidate, signature, and 32-character ISN.

06

Decision gate

Stop unless every vehicle, file, authorization, power, and recovery prerequisite is satisfied.

07

Run approved mutation

Use only the action called for by the repair plan. Do not combine erase/reset operations by habit.

08

Reconnect

Allow reboot/settling, rescan if necessary, and verify the complete identity set again.

09

Capture After

Read/save normal and shadow results, finish OEM commissioning/functional checks, and close the work order only on evidence.

Mutation decision gate

Gate	Pass condition	If not passed
Vehicle	Physical VIN, work order, BMW CAR VIN, EME VIN, and selected gateway reconciled.	Stop and re-identify.
Data	Immutable source retained; current working file has accepted length and expected parse.	Reject the file; do not alter it to fit.
Communication	Fresh stable Connect result and no competing session.	Correct network/power state first.
Evidence	Before normal and shadow reports saved.	Read and save before mutation.
Safety	Qualified personnel and current OEM conditions in force.	Escalate to authorized workshop procedure.
Recovery	Expected outcome and response to timeout/ambiguity are defined.	Do not dispatch.



CHAPTER 20

Troubleshooting · startup, license, network

Symptom	Checks and corrective action	Do not do
Application does not start	Confirm complete release, valid BinUnlock LLC signature, Windows support, .NET Framework 4.8, local read permission, and normal Windows event/security logs.	Do not download random DLLs or disable protection.
Unknown publisher or signature error	Stop and obtain a verified release from the approved BinUnlock channel.	Do not run an unsigned/repacked copy.
License file not found	Copy the displayed HWID, request the intended 10/30/Never license, install the received file, then Retry.	Do not rename or edit another product's license.
License belongs to another computer	Re-copy this computer's HWID and request the correct license.	Do not alter HWID fields or move system identity data.
License expired	Confirm correct clock/time zone and request renewal.	Do not roll the clock backward.
Trusted-time/clock message	Correct Windows synchronization and contact BinUnlock with the complete reason text.	Do not delete security state by guess.
No gateways found	Check support power, ignition/wake state, cable/link, IPv4 address/mask, adapter order, firewall, VPN, virtual adapters, and competing tools. Then repeat one scan.	Do not enter a guessed vehicle IP for a mutation.
Expected VIN not listed	Confirm bay/vehicle and network route. Capture all rows. Correct the environment before selecting.	Do not choose the "closest" VIN.
Scan window cannot close	Discovery is still active; wait for every subnet receive opportunity to finish.	Do not kill the process or unplug the adapter mid-scan.
Please enter ZGW IP	Scan/select a verified gateway to use the automatic chained Connect route, or enter the approved nonempty host and select Connect to CAR manually.	Do not use whitespace or arbitrary text as a connectivity test.
No identity response	Verify selected IP, power, wake state, firewall, and UDP/6811 path; rescan.	Do not proceed to reset/erase.
EME not detected / empty roots	Verify TCP/6801 path, EME availability, session conflicts, and correct vehicle. Reconnect after correction.	Do not accept a populated gateway VIN as proof of EME communication.
EME VIN contains ?	Record the exact text and verify identity through approved diagnostics.	Do not treat sanitized/nonprintable bytes as a valid VIN.

USE THE FIRST FAILED PREREQUISITE

Work from workstation → license → power/link → discovery → identity → read-only evidence → mutation.
Repeating the last step cannot repair an earlier prerequisite.



CHAPTER 20 · CONTINUED

Troubleshooting · files, DTC, mutations

Symptom	Checks and corrective action	Do not do
EEPROM size rejected	Confirm source/read procedure and exact byte count: 524,288; 786,432; or 868,352.	Do not pad, truncate, or concatenate the dump.
VIN not found in file	Verify the correct unmodified dump and source unit; parser searches WBA, then WMW, then SUX.	Do not type a VIN into the binary.
No ISN signature	Record status, retain source, verify family/read quality through approved procedure. The prior Reset ISN enabled/disabled state is preserved.	Do not press Reset ISN based on whichever prior state remains.
F-series message	The Kind 1/2 signature branch explicitly disabled Reset ISN. Reassess applicability with the repair plan.	Do not circumvent the disabled state.
Report shows count 0 / (NO DTC)	Treat as ambiguous; silence or absorbed post-connect I/O failure can still produce the read-complete modal and zero report.	Do not document “fault free” or “valid response” from count/modal alone.
Unexpected DTC row	Remember catalogue keys match anywhere in complete hex, including odd nibble alignment and padding.	Do not replace a component on one substring match.
DTC save is zero bytes	The visible list was literally empty at save time. A completed zero-count report would contain multiple lines including (NO DTC).	Do not present either state as proof of a successful ECU response.
Erase/reset says success but fault/state remains	The operation validates absence of an exception, not positive response content. Reconnect/read and use approved diagnostics.	Do not repeatedly erase/reset.
“Possible that the EME ISN is reset”	Final response bytes were not the definite-success marker. Preserve state and diagnose before deciding on retry.	Do not translate “possible” into confirmed success or failure.
ISN reset error/timeout	Keep power stable, capture exact error/time/data context, reconnect and determine current ECU state.	Do not blind-retry; request may already have been received.
Window will not close	A protected action is active. Let it reach its configured terminal state.	Do not force-close or power-cycle.
PDF export fails	Use a writable local path, close the existing target in other software, and retry export.	Do not overwrite unrelated files.

Support package

Provide the application release/signature status, registered customer (only within the authorized case), Windows version/scaling, complete vehicle identity context, ZGW IP, exact action/time, full message text, network/power conditions, EEPROM size/hash where applicable, software roots, and Before/After normal and shadow exports.

OFFICIAL SUPPORT

Use <https://binunlock.com/>. The same fixed address opens from the green favicon in emeOBD.

Compact glossary

Term	Meaning here	Term	Meaning here
DTC report	Structured visible report containing count/context plus catalogue matches or (NO DTC).	EME	Electric-machine electronics control-unit context targeted by the app.
ZGW	BMW central gateway on the diagnostic Ethernet route.	ISN	16-byte value rendered as 32 hexadecimal characters by supported EEPROM branches.
Normal	Standard EME diagnostic-memory request.	Shadow	Separate EME shadow-memory request.
HWID	Stable computer identifier used for license binding.	Software roots	Recognized BTLD/SWFL/HWEL and related response records.

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