DOBACK ELITE

USER MANUAL

Integrated Rollover Prevention and Data Recording System

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1. About This Manual

This manual contains the operating instructions for the DOBACK ELITE system, CSG Ingeniería's integrated solution for real-time rollover prevention and intelligent vehicle data recording.

The system acts as an intelligent interface between the vehicle and data analysis: it captures CAN bus information, processes it locally and stores it for subsequent exploitation, while simultaneously alerting the driver to any rollover risk.

BEFORE YOU BEGIN

Read all instructions before operating the system.
Do not start the engine until DOBACK ELITE has completed its start-up sequence (~1.5 s after ignition).
For any queries, contact CSG Ingeniería.

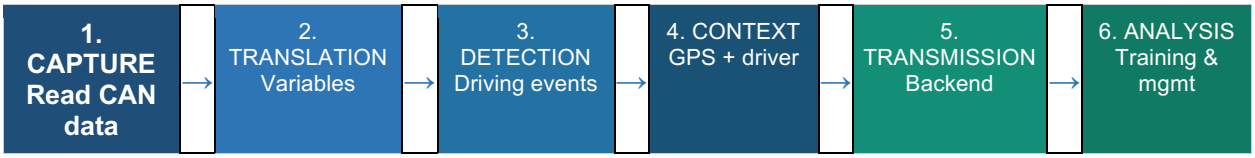
2. System Description

2.1 Main Functions

Function	Description
Rollover prevention	Calculates stability 10×/second and alerts driver via LEDs, beeps and voice when stability falls below 30%.
CAN data capture	Continuously reads vehicle CAN bus data (J1939/FMS): speed, engine, load and other parameters.
Local processing	Translates CAN frames into understandable variables and detects relevant driving events.
Data storage	.log files automatically converted to .csv on SD card (8–32 GB).
Contextualisation	Cross-references driving data with GPS position (optional) and driver ID.
Web interface	Accessible via Ethernet or WiFi for configuration, data download and diagnostics.
Fleet management	Automatic download when connecting to configured WiFi access points.

2.2 Data Flow

DOBACK ELITE processes vehicle information through 6 continuous automatic steps:



3. Start-Up

3.1 Start-Up Sequence

1. Upon ignition, DOBACK ELITE automatically begins its start-up sequence.
2. Performs inertial calibration (zero-setting). DO NOT start the engine during this process.
3. When the sequence completes (~1.5 s), the system is ready.
4. The driver can start the engine and operate normally.

⚠ IMPORTANT

Starting the engine during calibration reduces the accuracy of rollover alerts.

3.2 LED Indicators

The panel LEDs confirm system status:

LED	Colour	On	Off
Battery signal	White	OK — battery power present	No battery signal
Ignition signal	Blue	OK — ignition active	No ignition signal
System status	Green / Red	Green: system correct	Red: system fault

When all LEDs show the correct state, DOBACK ELITE is operational and automatically recording data.

4. Rollover Alerts

4.1 Driver Operation

The driver operates the vehicle normally, paying attention to DOBACK ELITE's indicators. No active input is required during normal driving.

- Visual indication via 10 variable-colour LEDs.
- Acoustic warnings (beeps of increasing frequency).
- Voice warnings (configurable audio message).

4.2 Visual Indication Scale

LEDs	Stability	Risk level and action
0	100% — Horizontal and static	Safe situation. Normal driving.
1–3	70–100%	High stability.
4–6	30–70%	Caution. Reduce speed if possible.
7–9	< 30% — Rollover risk	Acoustic and voice alerts active. Correct manoeuvre immediately.
10	0% — Imminent rollover	Maximum emergency. Continuous beep.

4.3 Acoustic Warnings

Risk level	Beeps
Orange level — reduced stability	1 beep / second
Red level — very low stability	4 beeps / second
Imminent rollover — stability = 0	Continuous beep

4.4 Voice Warnings

The integrated speaker emits configurable voice messages. By default it announces rollover risk when stability falls below 30%. Up to 255 different voice messages configurable by CSG.

5. System Access

5.1 Management Web Interface

DOBACK ELITE has a management web interface accessible from any computer. The system must be powered (battery + ignition ON) to access.

5.2 Ethernet Connection

Required material

- x1 Ethernet cable.
- x1 Computer with Ethernet port (or adapter).

Procedure

5. Connect the Ethernet cable to DOBACK ELITE's port.
6. Connect the other end to the computer.
7. Set a fixed IP on the computer's Ethernet adapter:

Network parameter	Value
IP address	192.168.5.2
Subnet mask	255.255.255.0

Default gateway	192.168.5.1

8. Open browser and enter the access address provided by CSG.
9. Enter the credentials provided by CSG.

5.3 WiFi Connection

- x1 DOBACK ELITE WiFi module.
- x1 Micro-USB cable.
- x1 Computer with WiFi.

10. Connect the WiFi module to the computer via micro-USB.
11. Connect the module's Ethernet cable to DOBACK ELITE.
12. Connect to the DOBACK ELITE WiFi network (name and password provided by CSG).
13. Open browser and enter the address and credentials provided by CSG.

ACCESS CREDENTIALS

Credentials are provided by CSG Ingeniería during commissioning.
Do not share with unauthorised personnel.

6. Web Interface Modules

Module	Description
Vehicle information	Query VIN, CVN and fault codes (DTCs) via CAN bus.
System configuration	Date/time, associated VIN, responsible technician.
CAN traffic	Real-time CAN frame visualisation (technician profile).
CSV files	File list, download and management.
Logs	Raw .log files for advanced analysis.

6.1 Vehicle Information

Vehicle VIN and CVN

14. Activate Manual Mode in the CAN Status block.
15. Press Request VIN / CVN.
16. Value will appear on screen.

Fault Codes (DTCs)

17. Press Request Stored DTCs.
18. Press Request Pending DTCs.

⚠ WARNING

DTCs must be interpreted in accordance with the vehicle manufacturer's procedures.

6.2 System Configuration

- Vehicle VIN: registers the associated chassis number.
- Responsible technician: for traceability.
- Press Save Configuration to apply.

Date and Time

19. Press Load Computer Date to synchronise.
20. Press Update Time to apply.
21. Refresh browser to confirm.

RECOMMENDATION

Record VIN and technician at commissioning. Keep date and time synchronised.

7. Data Analysis and Use

Application	Description
Driver training	Analysis of driving events to identify risk behaviours and design individual programmes.
Fleet management	Continuous monitoring. Automatic download at configured WiFi points.
Route analysis	Detailed review of routes, speeds, stops and loads.
Predictive maintenance	DTC reading and CAN parameters to anticipate failures.
Accident analysis	Reconstruction of events prior to an incident.

8. Troubleshooting

Symptom	Checks
LEDs do not light up	Check power connection and ignition signal. Check fuse.
Status LED red	Internal fault detected. Contact CSG.
Frequent false alerts	Check start-up calibration and rigid mounting to vehicle.
No web interface access (Ethernet)	Check system powered, Ethernet cable and IP address.

WiFi network not visible	Check WiFi module connected and powered. Wait and scan again.
No VIN/CVN	Activate Manual Mode. Verify active CAN bus.

9. Best Practices

- Always wait for start-up sequence to complete before starting the engine.
- At any rollover alert, reduce speed and stabilise the vehicle immediately.
- Keep date and time synchronised for data traceability.
- Carry out periodic file downloads as per defined operating procedures.
- Do not share credentials with unauthorised personnel.
- Configure WiFi access points at the depot for automatic fleet download.

10. Technical Support

- Firmware version (footer of web interface).
- Connection method: Ethernet or WiFi.
- Detailed problem description and steps taken.
- Screenshots of the affected module.
- Time of incident. Vehicle VIN.

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Annex A

Parametrisation — Vehicle Data Sheet

Annex A — Parametrisation

Vehicle Data Sheet

Complete this form and send it to CSG Ingeniería at least 48 hours before commissioning.

A. Vehicle Identification

A. Vehicle Identification		
Date		
Manufacturer		
Model		
Chassis number (VIN)		
Registration plate		
Bodybuilder		
Cab type / Trailer *without — with*		
Company		
Responsible technician		

B. Vehicle Dimensions [mm]

B. Vehicle Dimensions [mm]		
Overall length without accessories		mm
Overall length with accessories		mm
Width without accessories		mm
Width with accessories		mm
Height without accessories		mm
Height with accessories		mm

C. Physical Characteristics

★ Essential data — must be provided without exception.

C. Physical Characteristics		
★ Centre of gravity height *Alt.: static rollover angle*		mm

★ Track width		mm
★ Total vehicle weight		kg
★ Moment of inertia Ixx (longitudinal axis)		kg·m²
★ Moment of inertia Iyy (transverse axis)		kg·m²
★ Moment of inertia Izz (vertical axis)		kg·m²
GVW — Gross Vehicle Weight		kg
Number of axles / Wheelbase		mm
Front / rear axle load distribution		%

D. Recommended Data

Recommended data — improve system accuracy.

D. Recommended Data		
Total roll stiffness		°/g
Roll angle at static rollover		°
Roll stiffness distribution by axle		% / axle
Tyre vertical stiffness		mm/1000kg
Tyre lateral stiffness		mm/1000kg
Damper curve axle 1		kg / km·h⁻¹
Mechanical advantage damper axle 1		adim.
Damper curve axle 2 (if applicable)		kg / km·h⁻¹
Mechanical advantage damper axle 2		adim.

E. Signals and Options

E. Signals and Options		
Additional functions required		
Signals at connector		
Voice messages required		
Vehicle CAN protocol *J1939 / FMS / OBDII*		
CAN bus speed		kbps

125 / 250 / 500 / 1000		

F. Attached Documentation

✓	Documento
☐	Vehicle dimensions drawing
☐	Weight distribution plan
☐	Vehicle technical datasheet
☐	Damper curves

G. Signature and Date

Nombre / Name:	Empresa / Company:
Firma / Signature:	Fecha / Date:

NOTE

Send to CSG Ingeniería with attached documentation at least 48 hours before commissioning.

Annex B

Installation Instructions

Annex B — Installation Instructions

Installation must be carried out by qualified technical personnel. Disconnect the vehicle battery before any electrical connection.

BEFORE YOU BEGIN

Disconnect the vehicle battery before any electrical connection.
Respect polarity of all connections at all times.
Sensor mounting orientation must remain constant across units of the same batch.
In case of doubt, contact CSG Ingeniería before proceeding.

1. Rollover Sensor Unit — Physical Installation

Location requirements

- Rigid mounting to chassis with no relative movement to the vehicle.
- Direct visibility of the LED display from the driver's seat.
- Clear audibility of the speaker from the driver's seat.
- Mounting orientation per CSG instructions (document photographically).

CRITICAL — RIGID MOUNTING

Any relative movement causes inertial errors and may result in false alerts or missed detections.
Do not mount on mats, foam or vibration-isolated supports.

Fixing procedure

22. Select location (central dashboard, steering column or front cab roof).
23. Clean and degrease the mounting surface.
24. Mark drill points using the supplied template.
25. Drill and remove burrs.
26. Fix with supplied screws at the correct torque.
27. Verify no relative movement by pulling in all directions.
28. Photograph final orientation (3 views: front, side, top).

2. Rollover Sensor Unit — Electrical Installation

Electrical specifications

Parámetro / Parameter / Parameter	Valor / Wert / Value

Rated voltage	24 V DC (ripple-free)
Operating range	9 – 34 V
Rated consumption	0.23 A
Maximum consumption	0.75 A
CAN protocol	ISO 11898 — J1939, FMS
CAN speeds	125 / 250 / 500 / 1000 kbps

Wiring pinout

Wire	Signal	Description and vehicle connection point
A — Blue	**START**	Vehicle ignition signal (active with ignition ON)
B — Black	**GND**	Vehicle chassis ground
C — Brown	**BLACK OUT**	Permanent battery positive — OPTIONAL
D — Yellow	**CAN-L**	CAN Low — after the vehicle diagnostic connector
E — Green	**CAN-H**	CAN High — after the vehicle diagnostic connector

Connection procedure

29. Identify the vehicle OBD/J1939 diagnostic connector (usually under the dashboard).
30. Connect wire D (CAN-L, yellow) to CAN-L of the diagnostic connector.
31. Connect wire E (CAN-H, green) to CAN-H of the diagnostic connector.
32. Connect wire A (START, blue) to the vehicle ignition signal.
33. Connect wire B (GND, black) to the chassis ground.
34. (Optional) Connect wire C (BLACK OUT, brown) to permanent battery positive.
35. Insulate all joints with heat-shrink. No exposed conductors.
36. Reconnect battery and verify system start-up sequence.

CAN CONNECTION

Connect in PARALLEL (TAP) to the existing CAN bus. Do not cut or interrupt the original bus.

3. Main Unit — Physical Installation

- Area protected from impacts and regular personnel traffic.
- Accessible for the technician (Ethernet or WiFi connection during maintenance).
- Protected from water and dust.

- Minimum 3 cm clearance around the side fan.
- Secure mechanical mounting to the vehicle.

37. Select location (under driver's seat, electronics cabinet or equivalent).
38. Clean the mounting surface.
39. Fix using the unit's anchor points with appropriate screws.
40. Verify all connectors remain accessible.
41. Verify minimum 3 cm clearance around the fan.

4. Main Unit — Electrical Installation

Connector J1 — Military 6-pin (recommended)

Pin	Signal	Descripción / Beschreibung / Description
A	**BATT (+)**	12V or 24V — Permanent battery supply
B	**IGNITION**	Ignition signal (active with ignition ON)
C	**CAN H**	CAN High of vehicle CAN bus
D	**GND**	Vehicle chassis ground
E	**CAN L**	CAN Low of vehicle CAN bus
F	**—**	Not connected

Connector J2 — Superseal 5-pin (alternative)

Pin	Signal	Descripción / Beschreibung / Description
1	**BATT (+)**	12V or 24V — Permanent battery supply
2	**IGNITION**	Ignition signal (active with ignition ON)
3	**GND**	Vehicle chassis ground
4	**CAN L**	CAN Low of vehicle CAN bus
5	**CAN H**	CAN High of vehicle CAN bus

42. Connect Pin A to permanent battery supply (12V or 24V).
43. Connect Pin B to the vehicle ignition signal.
44. Connect Pin D to the chassis ground.
45. Connect Pin C to CAN-H of the vehicle CAN bus.
46. Connect Pin E to CAN-L of the vehicle CAN bus.
47. Leave Pin F unconnected.
48. Insert and secure the connector in the unit receptacle.

5. Parallel CAN Integration

Both units connect in PARALLEL to the same CAN-H / CAN-L pair of the vehicle, without interrupting the original bus.

FUNDAMENTAL RULE

CAN-H of both units goes to the SAME point on the vehicle CAN bus.
CAN-L of both units goes to the SAME point on the vehicle CAN bus.
NEVER connect the two units in series on the CAN bus.

Vehicle connection point	Main Unit (J1/J2)	Rollover Sensor Unit
CAN-H of bus (diagnostic connector)	Pin C (J1) / Pin 5 (J2)	Wire E — Green
CAN-L of bus (diagnostic connector)	Pin E (J1) / Pin 4 (J2)	Wire D — Yellow
Ignition signal	Pin B (J1) / Pin 2 (J2)	Wire A — Blue
Vehicle ground	Pin D (J1) / Pin 3 (J2)	Wire B — Black
Permanent battery (+)	Pin A (J1) / Pin 1 (J2)	Wire C — Brown (OPT.)

6. Post-Installation Verification Checklist

Check and tick all items before requesting commissioning from CSG.

#	OK	6. Post-Installation Verification Checklist
1	☐	Rollover sensor rigidly mounted with no relative movement to vehicle
2	☐	Sensor visible and audible from driver's seat
3	☐	Mounting orientation documented photographically (3 views)
4	☐	Main unit mechanically fixed with connectors accessible
5	☐	Main unit fan: minimum 3 cm clearance
6	☐	Wire A (START, blue) connected to vehicle ignition signal
7	☐	Wire B (GND, black) connected to chassis ground
8	☐	Wire D (CAN-L, yellow) connected to vehicle CAN-L
9	☐	Wire E (CAN-H, green) connected to vehicle CAN-H
10	☐	Main unit Pin B/2 connected to ignition signal
11	☐	Main unit Pin A/1 connected to permanent battery
12	☐	Main unit Pin D/3 connected to chassis ground
13	☐	Main unit Pin C/5 connected to vehicle CAN-H

14	☐	Main unit Pin E/4 connected to vehicle CAN-L
15	☐	All joints insulated with heat-shrink tubing
16	☐	CAN-H of both units at same point on vehicle CAN bus
17	☐	CAN-L of both units at same point on vehicle CAN bus
18	☐	Original CAN bus NOT interrupted — TAP / parallel connection
19	☐	Battery LED (white) on with ignition
20	☐	Ignition LED (blue) on with ignition
21	☐	System status LED GREEN — no faults detected
22	☐	Rollover sensor start-up sequence correct (LED sequence)