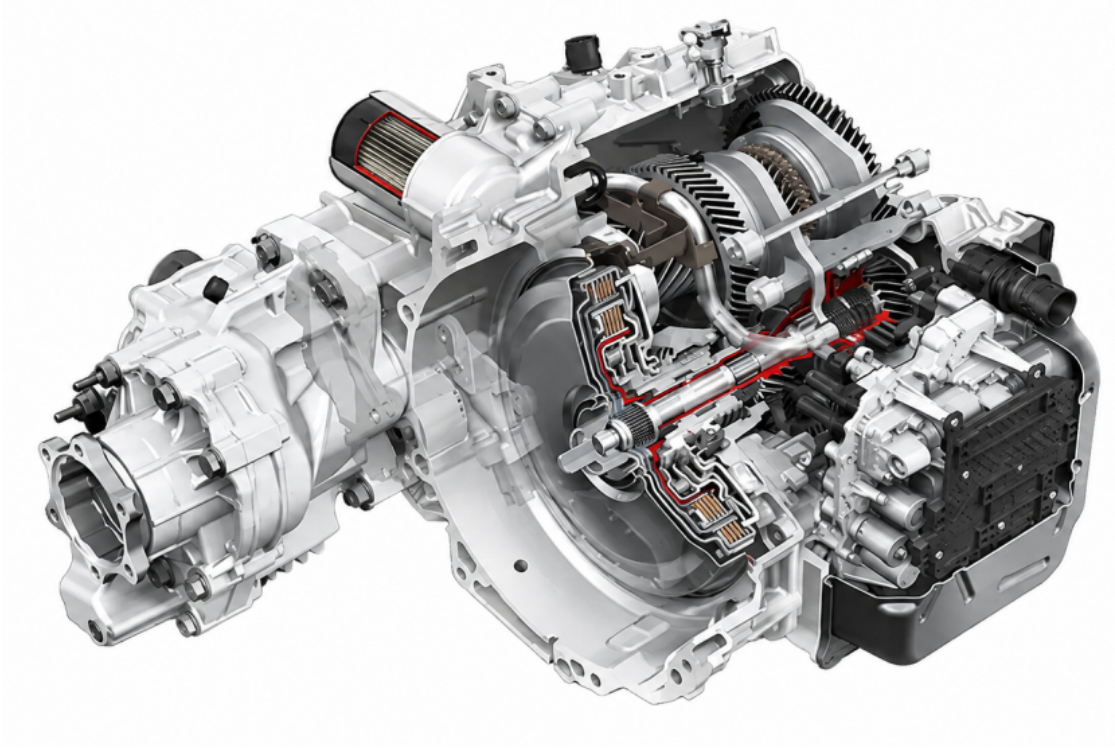
DQ500 Non-MQB for PQ35 Platform

Installation, configuration and diagnostics

Revision 7 | 29 October 2026



Seven-speed DQ500 • 0BH / 0BT

Standalone control for supported non-MQB controllers, with SyvTCM shifter selection, engine torque exchange and UDS diagnostics.

> Use the matching **1.61.1 firmware and SCal profile**. This is a new non-MQB implementation: host regression tests and the firmware build have passed; commissioning on the intended gearbox remains necessary.

Transmission-family cutaway. Identify the controller from its part number and diagnostic identification; external appearance alone does not determine its CAN protocol.

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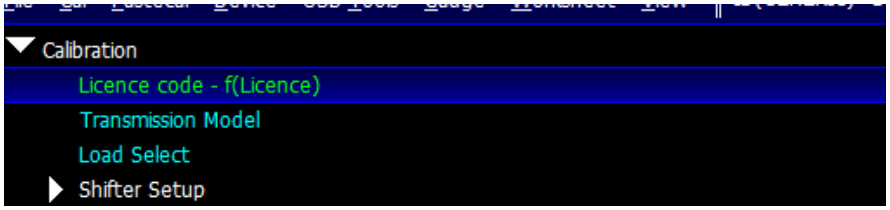
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Licence code and activation

> **Your SyvTCM is supplied with the licence key already entered for your order.** A copy of the key is also supplied with the SyvTCM. Keep this copy with the unit's records; normal initial setup does not require you to obtain or enter a new key.

The **Licence code** map is at the top of the SCal calibration tree. Save a backup of the supplied calibration before making changes. The licence belongs to the unit and its permitted transmission coverage.



If you cannot find the supplied copy

Email **support@syvecs.com** with the details below if you cannot find the copy of your key. You do not need to request a key before using a unit with its valid preloaded licence.

Information for support	What to send
Module serial number	The complete SyvTCM serial number, for example A*****.
Transmission model	The exact Transmission Model selection and the transmission ordered.
Order / invoice	Your order or invoice details.

Restoring the key, if required

Only re-enter the key if it needs restoring, for example after loading a calibration that replaced the licence values. Use the copy supplied with **this unit**.

1. Connect SCal, save the current calibration and check that **Transmission Model** matches the ordered transmission and installed gearbox.

2. Open **Licence code**. This is one licence consisting of **two hexadecimal values**. Enter both supplied values, in order, into the two map cells. Preserve every digit and letter; do not swap the values or convert them to decimal.

3. Save the calibration and use **Device → Program** to store the setup and apply blue configuration changes. Reconnect after the unit restarts and check the SCal message panel for successful licence validation.

If the licence is rejected

If SCal reports that the unit is not licenced for the selected transmission type, check both key values against the supplied copy, the unit serial number and Transmission Model. If it still fails, email support with these details, the firmware/profile version and screenshots of the licence map and message panel.

Identify the installation



Select **DQ500 Non-MQB** in **Transmission Model**. The MQB selection uses a different protocol and must not be used as an interchangeable setting.

Record before installation	What to establish
Gearbox and mechatronic identity	Donor vehicle, gearbox code, TCM hardware/software part numbers and installed calibration.
Diagnostic transport	This implementation uses UDS over CAN. Earlier KWP2000/TP2.0 controllers need an external compatible diagnostic tool.
Mechanical installation	Correct fluid, cooling, driveline, selector cable / Park linkage and donor service procedures.
Electrical variant	Verify connector moulded cavity numbers, supply circuits and ignition input against the exact donor diagram.

> A housing designation or transmission photograph does not guarantee controller compatibility. Keep a diagnostic identification readout with the vehicle build record.

CAN networks

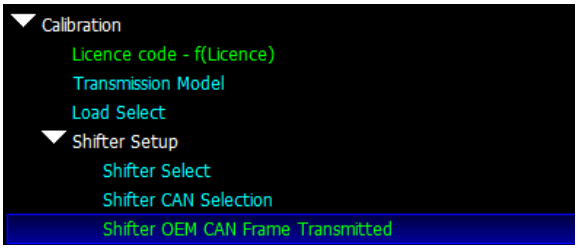
CAN1 is the gearbox network, at 500 kbit/s. Use CAN0 for a translated electronic shifter. Set Shifter CAN Selection to the bus physically wired to the shifter.

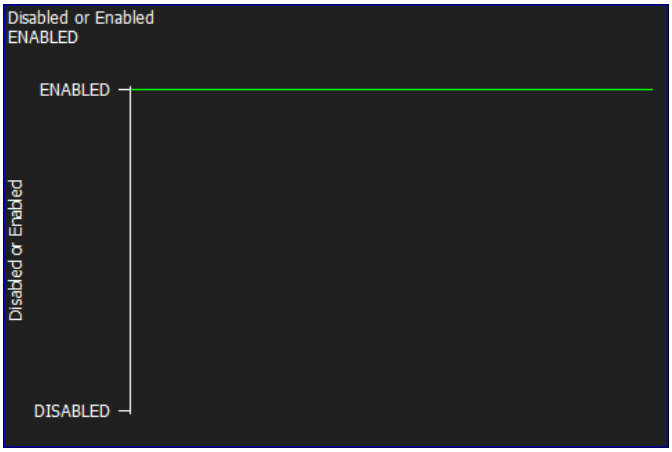


Network	Connections / use
SyvTCM CAN1	A17 CAN High; A18 CAN Low. Gearbox TCM and diagnostic socket.
SyvTCM CAN0	A14 CAN High; A15 CAN Low. Translated shifter; compatible configured ECU traffic may share this bus.
Native VAG selector	May share CAN1 with gearbox emulation disabled. See the dedicated selector page.

Shifter emulation map

Shifter Setup → Shifter OEM CAN Frame Transmitted: enable when SyvTCM supplies gearbox selector commands. Disable when a native selector already sends them on CAN1.





Bus construction

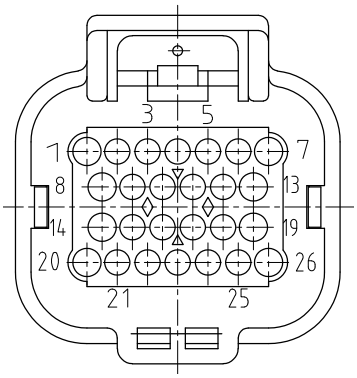
Use a twisted pair, short branches and a common ground reference. Fit two 120-ohm terminators, one at each physical end, accounting for termination already present in the modules. With power removed, approximately 60 ohms across CAN High and CAN Low is expected.

A translated shifter on CAN0 does not need a direct bridge to CAN1. SyvTCM interprets its selection and supplies the gearbox commands when emulation is enabled.

SyvTCM connector pinout

Mating housing: **TE 3-1437290-7**. Each A-number identifies one SyvTCM connector cavity.

SyvTCM pin	Function
A1	Power ground
A2	Power ground
A3	Assignable H-bridge output 1
A4	Assignable H-bridge output 2
A5	Assignable H-bridge output 3
A6	Assignable H-bridge output 4
A7	High-current 12 V supply
A8	K-line / LIN
A9	Magnetoresistive wheel-speed input 1
A10	Magnetoresistive wheel-speed input 2
A11	Magnetoresistive wheel-speed input 3
A12	Magnetoresistive wheel-speed input 4
A13	High-current 12 V supply
A14	CAN0 High
A15	CAN0 Low
A16	Ignition-switched 12 V
A17	CAN1 High
A18	CAN1 Low
A19	High-current 12 V supply
A20	Regulated 5 V sensor supply
A21	Assignable analogue input AN1
A22	Assignable analogue input AN2
A23	Assignable analogue input AN3
A24	Assignable analogue input AN4
A25	Power ground
A26	Power ground



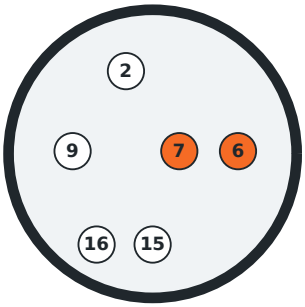
Rear / wire-entry view; latch at top.

Rows run left to right: 1–7, 8–13, 14–19, 20–26.
Housing pin 1 is A1. The mating-face view is reversed.

Assign logical inputs and outputs in SCal I/O Configuration. Fuse supplies for the installed harness and loads.

DQ500 gearbox connector

0BH / 0BT, 16-way gearbox connector. Mating housing: **3D0 973 993**. Confirm the housing keying and terminals for the donor.



Selected connection cavities, not to scale. Match the moulded numbers on the installed connector before wiring.

Gearbox pin	Function	Connection
2	Variant-dependent ignition	Verify donor wiring; see note
6	CAN High	SyvTCM A17
7	CAN Low	SyvTCM A18
9	Permanent battery +12 V	Fused battery supply
15	Ignition +12 V*	Switched ignition supply; see note
16	Power ground	Suitable power ground

> ***Verify the ignition input for the installed TCM.** Confirm whether the donor requires ignition power on pin 15 or pin 2 before powering the TCM. The pin 15 arrangement is shown here. Do not join pins 2 and 15.

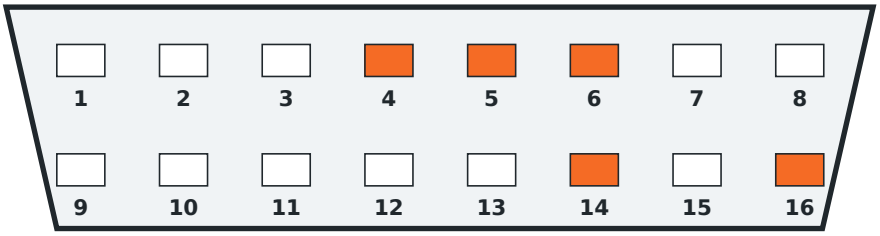
Size and fuse the harness for the circuit loads, cable lengths and installation environment.

Power, Park and diagnostics wiring

Provide fused permanent power, switched ignition and grounds according to the verified donor circuit. Check voltage and ground drop at both modules during cranking.

Mechanical Park: retain and adjust the donor gearbox's required Park cable/linkage. A CAN Park request does not operate a missing linkage or apply the vehicle parking brake.

OBD-II diagnostic socket on CAN1

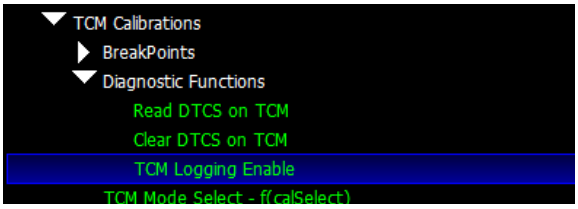


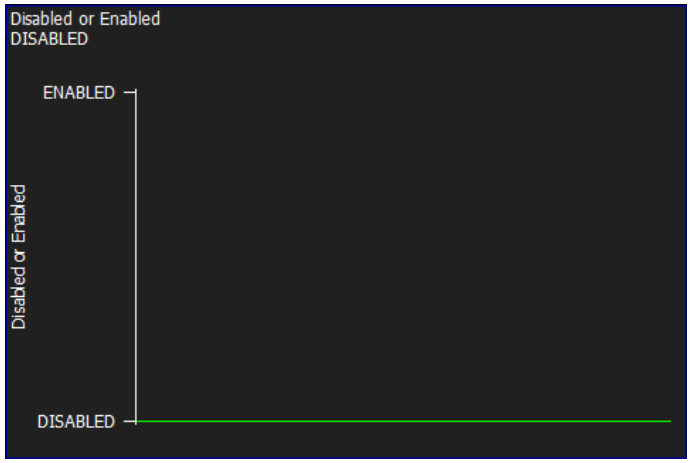
Vehicle-side female socket, viewed into the front / mating face. Wide edge at the top. The rear wire-entry view is mirrored. Highlighted pins are used below.

OBD-II pin	Connection
4	Chassis ground
5	Signal ground
6	CAN High — gearbox CAN1 / SyvTCM A17
14	CAN Low — gearbox CAN1 / SyvTCM A18
16	Fused battery +12 V

Disable TCM logging before using a diagnostic tool

TCM Calibrations → Diagnostic Functions → TCM Logging Enable = Disabled. Also leave Read DTCS on TCM and Clear DTCS on TCM Disabled.





Use a tool that supports direct access to the standalone transmission. Disable built-in diagnostic requests throughout the tool session; normal gearbox control traffic continues.

Initial SCal configuration

Start with the supplied calibration and save a backup. Use the matching **1.61.1 firmware/profile**. The ordered licence is preloaded; see page 3. Apply blue configuration changes using **Device > Program**.

Setting / area	Configuration
Transmission Model	DQ500 Non-MQB
Shifter Select / Shifter CAN Selection	Choose the installed shifter and wired bus. Recommended translated-shifter bus: CAN0.
Shifter OEM CAN Frame Transmitted	Enable for SyvTCM selector emulation; disable for a native VAG selector on CAN1.
TCM Calibrations > Vehicle Coding > DQ500 Non-MQB Dash Coding	Select the required preset. Default 1; see page 15.
Torque Options	Set the torque source, physical torque model and engine-controller torque-limit scaling.
Diagnostic Functions	Keep logging/read/clear disabled for initial wiring checks.
Configured VehicleSpeed	Verify the external road-speed source and units.
TCM Mode Select	Hidden and unused for this transmission. Use the shifter for supported Drive/Sport/Manual range requests.

Acceleration and speed correction

Speed Options > Calculate LongG from Delta Speed: Enabled transmits filtered LongGCalculated from configured VehicleSpeed; Disabled uses the LongG input. The calculation updates every 200 ms. Verify acceleration/deceleration signs; lateral acceleration is not estimated.

Vehicle Speed Output Correction scales the road speed sent to the TCM. Default **1.000** leaves it unchanged. Measured VehicleSpeed, speed outputs and calculated LongG retain the configured source speed.

Inputs and vehicle speed

Logical input / item	Required setup
Rpm	Engine speed in RPM. Check cranking and running values.
Pps / TpsMax	Driver pedal and throttle signals. Verify released and full-travel values.
VehicleSpeed	Configured vehicle road speed. Verify against an independent reference.
BrakeLight / Bpf	Assign the physical brake input or configure the brake-pressure path and threshold. Bpf is front brake pressure.
PaddleUp / PaddleDown	Correct logical assignments, inactive at rest; each direction separately active when pulled.
Engine torque items	Actual, potential, driver demand and friction torque in physical Nm; see torque page.
Ect1 / Eot	Valid engine coolant/oil temperatures where supplied by the engine interface. These are not gearbox temperatures.

Wheel-speed emulation

The non-MQB drivers use **configured VehicleSpeed for all four simulated wheel speeds**. Separate rear-left/right inputs are not required by this implementation. An old shaft-derived-speed setting does not override VehicleSpeed on these models.

Brake ownership and acceleration

A configured physical brake input takes priority; otherwise the configured brake-pressure path supplies the brake state. Do not assume a particular analogue socket is the brake input without checking I/O allocation.

Both non-MQB drivers transmit LongGCalculated when Calculate LongG from Delta Speed is Enabled, or the configured LongG input when Disabled. See page 8. DQ500 also uses configured LatG; DQ250 retains its fixed lateral-acceleration value.

Engine inputs and I/O setup

Assign physical pins in **I/O Configuration**, or configure the engine/vehicle CAN source and Generic Receive channels. A logical sensor name does not identify a fixed physical pin.

Parameter	Input and setup
RPM	Use the configured engine-CAN channel or a compatible conditioned pulse input. Verify RPM while cranking and running.
Vehicle speed	Select the intended CAN, wheel-speed or other supported source. Calibrate the source and compare against an independent road-speed measurement.
MAP / TPS / PPS	MAP and TPS can supply the selected torque-table load axis; PPS supplies driver demand. Check units, offset and full travel.
Brake switch / pressure	Set the allocated input type, polarity and threshold. If no physical brake-switch source is assigned, the brake-pressure threshold path determines BrakeLight.
Paddles	Assign PaddleUp and PaddleDown, choose suitable input type/pull-up, then set polarity and voltage thresholds. Thermistor input mode supplies the internal pull-up. Verify inactive/active states in gauges.
Engine temperatures	Set correct coolant/oil temperature sources and sensor linearisation where used. Engine temperatures are not gearbox-temperature measurements.

Output setup

Assign the required output function, drive type and wiring for each load. Configure custom PWM outputs using the chosen item axes and duty map where needed. Confirm polarity and physical operation with output testing before normal use.

Supplied calibration and programming

Save a backup of the supplied calibration before making changes. The ordered licence is preloaded; see page 3 for the supplied key copy and restoration instructions. Program blue configuration changes using Device → Program, then verify live inputs again.

Engine torque integration

The gearbox expects a coherent engine torque model and an engine ECU that can carry out torque reductions and blips. Correct CAN wiring alone does not establish correct clutch control.

Item / map	Meaning
EngTrqEstOutputExt	Estimated actual delivered engine torque.
EngTrqEstOutputPot	Potential engine torque before active reduction.
EngTrqDmdPps	Driver torque demand from the pedal.
EngTrqEstFriction	Estimated engine friction / loss torque.
Use Internal Torque maps	Select the intended source of the physical torque model; avoid conflicting engine-CAN and internal-map assumptions.
Torque Maximum	Physical torque-model calibration. It is not MDNORM, a gearbox capacity rating or a TCM reflash.
EngTrqLim Scaler to Engine Controller	Scales the received torque-reduction limit for the configured engine interface.

> Keep engine items in physical Nm. Do not halve ECU torque values to compensate for CDMA; the DQ500 driver performs that encoding when enabled.

Incoming torque limits use a fixed 500 Nm reference. They do not automatically follow the DQ500 MDNORM map or apply an unverified inverse CDMA scale. Confirm requested versus delivered torque during controlled commissioning.

The no-limit indication is 2500 Nm, also used when required feedback is stale. This is not a guaranteed torque-cut response to lost CAN. Configure the engine interface to recognise lost or invalid TCM feedback.

GearBlipState is available, but TargetRpm is a placeholder in this implementation. Do not use it as a measured or validated rev-match target.

Torque map functions

TCM Calibrations → Torque Options. Keep values in physical Nm and check the selected load axis before editing maps.

Map	Function in SyvTCM
Use Internal Torque maps	Enabled: derive potential and demanded torque from the internal tables. Disabled: use the configured incoming torque channels.
Load Select	Selects TPS, MAP or torque as the load axis for the applicable tables. Available at the calibration root.
Torque Actual Internal Table	RPM × selected load table supplying potential torque. Torque reduction modifiers produce the actual torque value sent to the TCM.
Torque Demand Internal Table	RPM × PPS table supplying driver demand when internal torque maps are enabled.
Engine Torque Multiplier	Produces the torque-reduction multiplier from the torque-limit multiplier and selected load. Review its effect on transmitted actual torque.
EngTrqLim Scaler to Engine Controller	RPM × selected load table used to scale the received engine torque limit for the engine interface.
Torque Maximum	Calculates EngTrqEstMax. It does not set MDNORM and is not a universal transmitted-torque clamp on these non-MQB drivers.

> Check both potential torque and actual torque after modifiers. Do not increase reported engine torque merely to conceal a clutch or calibration problem. DQ500 CDMA changes the representation at transmission, not the physical units of these tables.

Verify that the engine controller acts on the torque request with the expected sign and magnitude. Logging a request without checking delivered torque is not sufficient to validate the shift.

MDNORM and CDMA

MDNORM is the reference used to represent engine torque on the gearbox network. **CDMA** permits the represented range to double by using a matching half-torque encoding and indicator.

DQ500 Non-MQB setting	This implementation
DQ500 Non-MQB CDMA Enable	Default Enabled. Uses half-torque encoding and the matching CDMA indicator.
DQ500 Non-MQB MDNORM	Default 500 Nm. Adjustable from 10 to 630 Nm in 10 Nm steps. Match the installed TCM calibration.
Visibility	These two maps are visible only when DQ500 Non-MQB is selected.

Example: MDNORM = 500 Nm

Physical torque	CDMA disabled	CDMA enabled
400 Nm	About 80% of the reference	About 40% encoded; receiver applies CDMA interpretation
Nominal represented range	About 500 Nm	About 1000 Nm

> 500 Nm is a default starting reference, not automatic detection of the TCM calibration. A mismatched CDMA setting or MDNORM can make transmitted torque inconsistent with the receiver. Keep the ECU model truthful and validate both settings against the actual gearbox software.

Increasing a reference does not increase clutch capacity, change mechanical limits or update TCM limiters. Incoming torque-limit conversion is a separate path, as explained on the preceding page.

Vehicle Coding presets

TCM Calibrations > Vehicle Coding > DQ500 Non-MQB Dash Coding
Default **1**. Choose the integer preset below. Preset names identify the supplied configuration; they do not certify every gearbox from that vehicle.

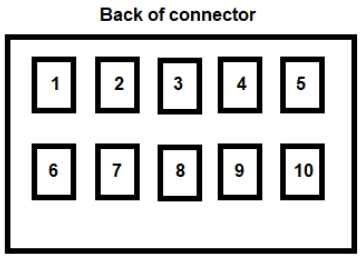
Value	Supplied preset
0	Audi A4
1	Golf Mk5 DSG (default)
2	Seat Leon
3	Golf R
4	Leon Cupra
5	Octavia TSI
6	Audi TT
7	Golf R UK
8	Skoda DSG
9	Golf R China
10	Polo WRC
11	Golf Mk6 GTI
12	Audi S3 8P

For DQ500 this setting selects supplementary dashboard frames. The supplied DQ500 engine coding stays fixed. Use the separate CDMA and MDNORM maps for torque encoding.

Only the coding map for the selected transmission is shown. Configure shifter operation, diagnostics and torque using their named maps.

VAG original / translated selector





Example assembly 7P1 713 041 C, knob removed. Smaller connector illustration: rear / wire-entry view. Mating connector 1K0 972 776 A. Verify the exact shifter variant.

Pin	Function
1	Ground
5	Dimmer input
7	CAN High
8	CAN Low
9	Ignition-switched +12 V
10	Permanent +12 V

Native selector on gearbox CAN1

For a compatible original VAG selector on CAN1: select **Original Used - NO TX** and **disable Shifter OEM CAN Frame Transmitted**. The real selector sends its own gearbox commands. Monitor reported GearboxPos; a translated ShifterPos/GearboxPosReq is not supplied by this mode.

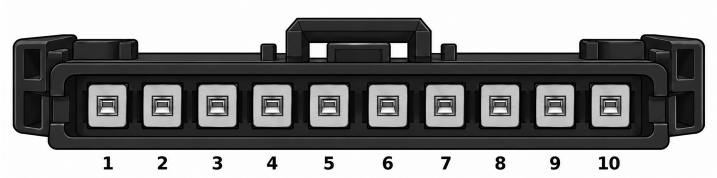
Translated selector on CAN0

For the supported VAG decoder on a separate CAN0 bus: select **VAG 2008 - 2015**, select CAN0 and enable gearbox shifter emulation. Verify that the particular assembly uses the supported messages.

> Do not select the VAG translator on CAN1 alongside a real selector that already sends the gearbox commands. The VAG shifter handler can transmit on its selected bus independently of the gearbox emulation setting.

BMW F Series Auto shifter





Rear / wire-entry view. Latch at top; pins 1–10 run left to right. Both versions use the same wiring. Mating connector: 9132571-02 / 1-929423-2.

Pin	Function
3	CAN Low
4	CAN High
7	Ignition-switched +12 V
8	Ground
10	Permanent +12 V

Shifter Select = BMW F Series Auto. Use CAN0 at 500 kbit/s where possible, set **Shifter CAN Selection = CAN0**, and enable **Shifter OEM CAN Frame Transmitted** so SyvTCM supplies the gearbox selector commands on CAN1.

Use the lever’s normal range selection, manual +/− operation and Park button. The existing Auto shifter behaviour is retained. Select the DCT option only for the DCT lever described on the next page.

BMW F Series DCT shifter



Rear / wire-entry view. Latch at top; pins 1–10 run left to right. Both versions use the same wiring. Mating connector: 9132571-02 / 1-929423-2.

Pin	Function
3	CAN Low
4	CAN High
7	Ignition-switched +12 V
8	Ground
10	Permanent +12 V

Shifter Select = BMW F Series DCT. Use CAN0 at 500 kbit/s where possible, set **Shifter CAN Selection = CAN0**, and enable **Shifter OEM CAN Frame Transmitted** so SyvTCM supplies the gearbox selector commands on CAN1.

Select D once for Drive. A separate repeated D selection toggles **Drive ↔ Sport D**. The lever must return before the next selection.

Either shifter +/− or Paddle Up/Down enters **Manual** from a forward range and latches it until another range is selected. Pulling both directions together does not generate a shift.

> There is no Park button. Select **Neutral twice within 2 seconds**, releasing between selections, to request Park. Holding Neutral is one selection; another lever movement cancels the pair. Speed interlocks and the mechanical Park requirement still apply.

Dodge electronic shifter



Connector: 9132571-02 / 1-929423-2.

Pin	Function
1	Ignition wakeup +12 V
4	CAN High
5	CAN Low
10	Ground

Shifter Select = Dodge. Use CAN0 at 500 kbit/s where possible, set **Shifter CAN Selection = CAN0**, and enable **Shifter OEM CAN Frame Transmitted** so SyvTCM supplies the gearbox selector commands on CAN1.

> Verify each requested range and the reported GearboxPos while stationary. Park remains dependent on the gearbox’s mechanical Park arrangement. Do not assume a connector illustration for another selector has the same pin orientation.

Toyota Supra A90 shifter



Connector: 9132571-02 / 1-929423-2.

Pin	Function
3	CAN Low
4	CAN High
8	Ground
10	Permanent +12 V

Shifter Select = A90 Supra. Use CAN0 at 500 kbit/s where possible, set **Shifter CAN Selection = CAN0**, and enable **Shifter OEM CAN Frame Transmitted** so SyvTCM supplies the gearbox selector commands on CAN1.

> Verify each requested range and the reported GearboxPos while stationary. Park remains dependent on the gearbox's mechanical Park arrangement. Do not assume a connector illustration for another selector has the same pin orientation.

JLR electronic shifter



Connector: Verify the connector for the installed selector.

Pin	Function
1	Ground
2	CAN High
3	CAN Low
9	Ignition wakeup +12 V
10	Permanent +12 V

Shifter Select = JLR 7E453 Defender SW2.5. Use CAN0 at 500 kbit/s where possible, set **Shifter CAN Selection = CAN0**, and enable **Shifter OEM CAN Frame Transmitted** so SyvTCM supplies the gearbox selector commands on CAN1.

Supported selector identification includes SW2.5 / N8B2 / P8B2 markings. Check identification and operating compatibility; JLR rotary and other selector families are not universally interchangeable.

> Verify each requested range and the reported GearboxPos while stationary. Park remains dependent on the gearbox’s mechanical Park arrangement. Do not assume a connector illustration for another selector has the same pin orientation.

CAN keypads



Select the supported **KeyPad Generic** or **KeyPad Grayhill/Motec** option and configure the keypad for its matching protocol. Follow the supplied keypad's connector drawing and power specification; its pinout is not the BMW connector pinout.

Use the configured shifter CAN bus at the required bitrate. Enable **Shifter OEM CAN Frame Transmitted** when SyvTCM is generating the gearbox range requests. Avoid a second selector transmitting the same commands on CAN1.

Commissioning

Check	Expected result
Button assignment	Park, Reverse, Neutral, Drive and any Manual / Sport buttons request the intended range.
State indication	Check actual GearboxPos as well as requested range. A request or lamp alone does not establish mechanical engagement.
Paddles	PaddleUp and PaddleDown must return inactive on release. Check shift directions individually.
Brake and lockouts	Verify the brake signal and configured Park/Reverse speed lockout before use.

> Keypad model, address and button layout are device-specific. Retain the matching keypad installation sheet with this manual. Do not transplant an unrelated keypad's CAN settings or wiring.

Paddles and range control



Assign PaddleUp and PaddleDown to the configured logical inputs. Use suitable switch wiring and input pull-ups for the allocated pins. Verify released = inactive and pulled = active in SCal before enabling range control.

Paddle / Brake range-control option

The shared paddle-controlled shifter uses brake state, vehicle speed and configured range interlocks. Paddle Up with the brake applied requests a forward range from Park/Neutral/Reverse; Reverse-to-forward handling includes a Neutral dwell. Paddle Down with brake applied at low speed can request Reverse.

Both paddles together request Neutral in this paddle-control mode; leaving Park or Reverse requires the brake. Release the switches to rearm the gesture. Use the Manual/Auto input to choose the forward mode where configured.

> This is a different selection from BMW F Series DCT. The BMW DCT mode has its own latched Manual behaviour and double-Neutral Park gesture. Do not use paddle-only gestures as a substitute for the instructions on the selected shifter’s page.

Park access

The paddle-only path has a startup Park request; it does not provide the DCT double-Neutral gesture. If the installation needs direct driver access to Park, provide a suitable selector/keypad and retain the required mechanical Park control.

Validate every gesture with the vehicle stationary and restrained before operating it under load. Speed and brake calibration directly affect range interlocks.

ChangeLight and automatic upshift

Reverse light

Assign the physical output in SCal; A3 is not automatically the reverse-light output. Select a suitable output type and interface for the lamp or relay load.

On non-MQB models, the built-in ReverseLight path follows **GearboxPosReq**. With a native original selector, use a custom output based on **reported GearboxPos = Reverse** when actual range is required. Verify the signal at the physical output.

ChangeLight and automatic upshift

ChangeLight works as a shift indicator in all modes. When it activates while **reported GearboxPos is Manual or Manual Sport**, it also generates a virtual **PaddleUp** request. This works with DQ250 and DQ500 non-MQB as well as the MQB models.

> **No physical ChangeLight output is required for automatic upshift.** Configure the maps under TCM Calibrations → Shift Options → Manual Mode → Auto Paddle Up Control. For a physical lamp, also assign ChangeLight to an output and set its Output Type under Output Functions → Change Light.

The same request reaches the non-MQB gearbox through SyvTCM selector emulation, or through the paddle-message path when a native VAG selector is used with emulation disabled.

Conditions and release

RPM must be above the configured threshold, with vehicle speed and TPS at or above their minima. The RPM table uses target gear and filtered RPM rate of change. A faster-rising RPM signal can therefore use an earlier threshold.

The request clears when RPM falls below threshold minus hysteresis, speed or TPS falls below its minimum, or the timeout expires. Leaving Manual releases the automatic paddle request. A held driver paddle remains active.

> The strategy requests an upshift; the gearbox decides whether to accept it. Verify the reported gear change and retain independent engine over-speed protection. Timeout alone does not rearm the strategy.

Automatic upshift threshold maps

TCM Calibrations → Shift Options → Manual Mode → Auto Paddle Up Control. These maps are also available under **Output Functions → Change Light**; both menu locations edit the same calibration.

Change Light On Mininum Vehicle Speed — f(targetGear)

Sets the minimum road speed for each forward gear. Activation is permitted at or above this value. Use it to avoid activation while stationary or during low-speed manoeuvres. It cannot independently identify wheelspin if the configured speed source is a spinning wheel.

Minimum Throttle Position for Change Light On — f(targetGear)

Sets the minimum TpsMax for each gear. The threshold must be met as well as RPM and speed. Higher settings restrict indication and automatic upshift to higher throttle operation; falling below the threshold clears the request.

Change Light On Engine Speed — f(targetGear, rpmDTR)

Sets the activation RPM using target gear and filtered engine RPM rate of change. RPM must exceed the selected threshold. Lowering the threshold at high positive rpmDTR can compensate for the time between requesting and completing a shift.

Illustrative calibration	Effect
Same RPM across all rpmDTR columns	Fixed RPM threshold in that gear.
Lower RPM at high positive rpmDTR	Requests earlier when engine speed rises quickly.
Different values by gear	Allows each forward gear to have its own shift point.

> Default values are 0 minimum speed, 50% minimum throttle and 10,000 RPM. These are calibration defaults, not recommended shift points. Set them for the engine, gearing and intended use before enabling automatic shifts through the chosen thresholds.

The speed and RPM-rate axes use the units displayed by SCal. Review their breakpoints as well as the table cells. Monitor targetGear, rpm, rpmDTR, vehicleSpeed, tpsMax, changeLight and paddleUp during setup.

Automatic upshift timeout and rearm

Change Light Off Engine Speed Hysteresis

Sets the RPM margin below the current activation threshold required to clear the light/request. For a 6,000 RPM threshold and 300 RPM hysteresis, the RPM clear condition is below 5,700 RPM. Default: 300 RPM.

Change Light Time-Out

Limits how long the light and automatic request remain active. Default: 300 ms. A setting of zero disables this timeout; the other clear conditions still apply.

> After a timeout, the strategy stays disarmed while RPM, speed and TPS still satisfy the activation conditions. RPM must fall below the hysteresis boundary, or speed/TPS below a minimum, before it can rearm. This prevents repeated requests from a continuously high RPM signal.

Stationary / controlled commissioning sequence

Step	Check
1 • Configure inputs	Verify target gear, actual Manual mode, RPM, TPS and vehicle speed.
2 • Set thresholds	Choose suitable per-gear RPM, speed and TPS settings; review rpmDTR breakpoints.
3 • Confirm request	When all conditions are met, changeLight and paddleUp should become active. No lamp pin is required.
4 • Confirm gearbox response	Compare requested upshift with actual and target gear; investigate a rejected or missed shift.
5 • Confirm release/rearm	Check timeout, RPM hysteresis, speed/TPS release and leaving Manual. Test that a held driver paddle is preserved.

A light already active in Drive does not create a new automatic paddle request merely by entering Manual. Clear and rearm the strategy so activation occurs in the intended mode.

UDS fault reading and clearing

The built-in DTC functions use **UDS over CAN** for both non-MQB models. Open **TCM Calibrations → Diagnostic Functions** and watch the SCal message panel.

Read

Set **Read DTCS on TCM** to **Disabled**, then **Enabled**. One read is issued on that transition. The panel reports raw three-byte DTC values and their status bytes; no MQB-specific descriptions are applied and TransFault is not decoded by this path.

> Example display: **TCM DTC 123456 status AF**. This is a format example, not a fault diagnosis. Up to six records are displayed. A larger list produces a “more DTCs” message; use a scan tool for the complete list and controller-specific descriptions.

Clear

Record the codes and correct their causes first. Set **Clear DTCS on TCM** to **Disabled**, then **Enabled**. A positive TCM response produces “TCM DTC clear acknowledged”. Read again to check the result; a persistent fault may return immediately.

Leaving Clear enabled does not clear faults at startup on these non-MQB models. A fresh Disabled → Enabled transition is required. If Read and Clear are enabled together, Clear takes priority; operate them separately.

Timeouts and diagnostic ownership

Pressure polling pauses during a DTC transaction. A rejected request reports the negative-response code; an incomplete or absent reply times out rather than reporting success. Disable the active control to cancel. Toggle it again to retry after investigating the cause.

External tester traffic cancels an active built-in transaction and temporarily pauses built-in diagnostics. Disable logging/read/clear explicitly before a scan-tool session. No automatic adaptation or security-unlock routine is performed.

A UDS-capable controller and successful bench validation are required. KWP2000/TP2.0 diagnostic transport is not implemented here.

Clutch pressures and logging limits

Clutch-pressure logging

Enable **TCM Logging Enable** to poll Clutch1Pressure and Clutch2Pressure. The non-MQB drivers alternate the two supported requests. Each pressure is converted to the existing SyvTCM pressure units (0.1 bar resolution).

A disabled logging map or a pressure reply older than one second results in zero for that pressure. Zero can therefore mean unavailable/stale as well as low pressure; it is not a separate validity flag. Polling pauses for DTC operations and detected external diagnostics.

> Confirm diagnostic support, clutch identity and pressure readings against a diagnostic tool on the installed TCM.

Measurement	Non-MQB 1.61.1 status
Clutch 1 / 2 pressure	Implemented; TCM diagnostic support and physical scaling require bench confirmation.
Gearbox oil / clutch temperatures	No verified non-MQB identifier and scaling implemented. Use an external diagnostic tool.
Gearbox input / output shaft speeds	No verified non-MQB decode implemented. Do not use these items as live measurements.
Engine Ect1 / Eot	Engine inputs, not gearbox temperature feedback.
TargetRpm	Placeholder, not a measured rev-match target.

Gearbox temperatures and shaft speeds are not available through these non-MQB drivers. Use a diagnostic tool for those measurements.

Basic settings and adaptation

Use an external diagnostic tool and the service procedure for the identified gearbox controller. Disable SyvTCM TCM Logging Enable and DTC Read/Clear first. The built-in DTC buttons do not perform clutch adaptation.

DQ500 / 0BH / 0BT reference prerequisites

Check correct fluid level, fluid temperature above 15°C, selector in Park, engine idling and both parking and foot brakes applied. Resolve relevant faults first, except the basic-settings-not-performed fault where the procedure allows it.

On supported UDS controllers, use the transmission basic-setting routine **IDE02903**. Monitor its state and abort information until it reports completion. Follow the prescribed ignition cycle afterwards. Availability and the exact procedure depend on the controller.

> Confirm gearbox fluid temperature with the diagnostic tool. SyvTCM 1.61.1 does not provide verified non-MQB gearbox temperature feedback. Do not substitute engine oil or coolant temperature.

After basic settings

Read fault codes again, check actual range and gear, and carry out the prescribed adaptation drive only after stationary checks pass. Investigate an aborted or failed routine before repeating it. Do not import MQB or PDK adaptation sequences into these non-MQB controllers.

Follow the complete donor-specific workshop procedure. This page summarises the prerequisites and does not replace that procedure.

Monitoring and feedback freshness

Log / monitor	Interpretation
GearboxPosReq	Commanded range from a translated shifter. May not represent a native original selector.
GearboxPos	TCM-reported range; becomes undefined after about one second without fresh range feedback.
Gear / TargetGear	Current and requested gear; DQ500 includes seventh. Current gear uses a delayed gear history.
ShiftState / GearBlipState	Shift/blip indications with feedback freshness and movement conditions.
EngTrqLim / EngTrqLimScaler	Received/scaled engine torque limit. Check the no-limit and stale-feedback behaviour on the torque page.
LaunchActive / TcmLimp	Launch-related feedback and a launch/limp heuristic. TcmLimp is not a complete DTC or fault classifier.
Clutch1Pressure / Clutch2Pressure	Requires supported diagnostic replies and enabled logging. Zero does not prove a valid zero-pressure measurement.
VehicleSpeed, BrakeLight, Rpm, Pps	Verify these foundational inputs before interpreting range and shift behaviour.
LongGCalculated / LongG	Speed-derived estimate / configured measured input. The acceleration map selects which is transmitted.
ChangeLight / PaddleUp / RpmDTR	Indicator state, combined driver/automatic upshift request and filtered RPM rate for the shift threshold.

Fast gear/shift feedback expires after about 250 ms; range and pressure feedback use about one second. Expired states are suppressed or reset according to the item, not universally retained.

> The startup TCM-presence warning is not a continuous communication-loss protection system. Monitor freshness and engine-interface behaviour during commissioning. Do not treat the absence of a warning or DTC as proof of a healthy drivetrain.

Commissioning checks

Stage	Acceptance check
1 • Power off	Verify donor pinout, connector orientation, fuses, grounds, mechanical Park and CAN termination.
2 • Ignition on	Correct voltage, stable CAN, matching non-MQB model/profile, diagnostic identification and expected live inputs.
3 • Stationary range checks	Brake interlock, requested versus actual P/R/N/D, Sport and Manual where provided; verify actual Park mechanism.
4 • Diagnostics	Read known faults, record raw values, clear intentionally, read back. Compare pressure channels with a scan tool.
5 • Engine / torque checks	Truthful torque model, confirmed CDMA/MDNORM for DQ500, sensible received torque limits and blip integration.
6 • Basic settings	Use controller-specific external-tool procedure and measured gearbox temperature. Resolve aborts/faults.
7 • Controlled running	Validate gear changes, input/vehicle-speed scaling, torque reductions, paddles, optional automatic upshift and cooling.

Capture logs of inputs, requested/actual range, gear, torque request, engine response and pressure. Keep the TCM identification and calibration settings with those logs so results can be reproduced.

> Host tests cover protocol handling, scheduling, conversions, isolation and diagnostic reply handling. They do not establish the connected TCM’s electrical variant, diagnostic identifiers, torque calibration or shift quality. Complete these checks before wider use.

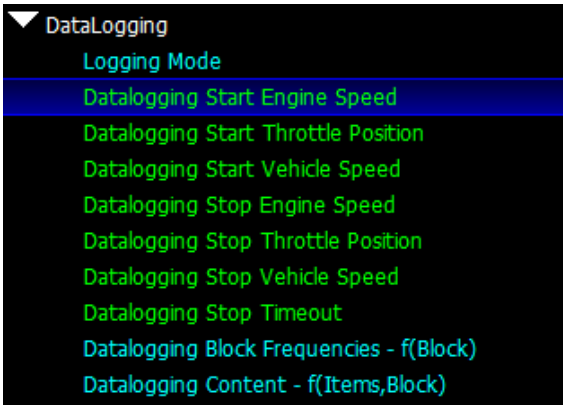
Troubleshooting

Symptom	Checks
No gearbox communication	Permanent/ignition supplies and grounds, CAN1 pins and bitrate, termination, selected model and TCM identity.
Bus becomes corrupt with a selector enabled	Wiring polarity/continuity, termination and duplicate message sources. Confirm native-selector versus translated-selector configuration.
Range request changes, gearbox does not	Actual GearboxPos, brake state, speed lockout, selector compatibility, mechanical linkage and TCM faults.
DTC read times out	UDS compatibility, direct TCM diagnostic access, power and competing tester. A timeout is not “no faults”.
Clear does nothing	Set Disabled then Enabled; look for positive acknowledgement or rejection. Read again to distinguish a rejected clear from a returning fault.
Pressure remains zero	Logging enabled, supported replies, no external-tool holdoff, channel freshness. Compare with a scan tool.
Incorrect torque / poor shifts	Engine model and units, DQ500 CDMA/MDNORM agreement, incoming torque-limit scaling, adaptations and mechanical condition.
No shaft speed / gearbox temperature	These non-MQB decoders are not implemented. Use an external tool; do not interpret default items as valid feedback.

For support, include firmware/profile version, TCM identity, selected transmission and dedicated coding preset, torque settings, shifter type/bus, wiring and a time-aligned CAN/SCal log.

Datalogging configuration

SyvTCM can record monitoring parameters through SCal on a laptop or to a USB memory stick. Both methods use the **Datalogging** maps for channel selection, sample rates and automatic start/stop conditions.



Datalogging map	Function
Logging Mode	Choose DATA for monitoring-parameter logs. NONE disables this logging mode. CAN is a separate raw-CAN recording mode.
Datalogging Content	Choose up to six monitoring items in each of the 40 blocks.
Datalogging Block Frequencies	Set the sample rate separately for each block. UNUSED disables a block; available rates are 1, 2, 5, 10, 20, 25, 50 and 100 Hz.

Program changes to blue configuration items with **Device → Program**. Confirm the channel list and rates before arming a recording. Use an SSuite version compatible with the installed firmware/profile.

Higher sample rates

To record one item above 100 Hz, repeat it in multiple 100 Hz blocks spaced evenly through the 40-block schedule. Block spacing = **4000 ÷ required rate**. For example, 400 Hz uses blocks **1, 11, 21 and 31**, with the item in each of those blocks.

The schedule allows up to 4000 samples per second for a repeated item. Choose a rate supported by the recording device and the source signal. Recording a CAN value faster does not make the transmitting controller or diagnostic polling update faster.

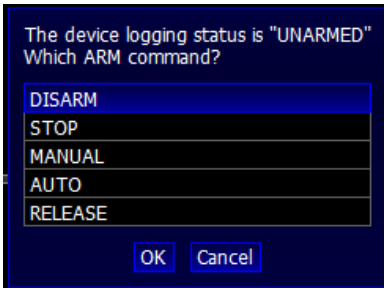
> **TCM Logging Enable is a different function.** It requests diagnostic measurements from the gearbox. Datalogging records available SyvTCM items. Enable diagnostic polling only when those measurements are needed; disable it before using an external diagnostic tool.

Logging triggers and laptop download

Set the start and stop maps under **Datalogging**, then use **USB-Tools → ARM Logging** to control laptop recording.

Map / condition	Behaviour
Start Engine Speed, Start Throttle Position and Start Vehicle Speed	AUTO starts only when RPM, TpsMax and VehicleSpeed are all at or above their respective start thresholds.
Stop Engine Speed, Stop Throttle Position and Stop Vehicle Speed	Automatic stop requires all three values to remain strictly below their stop thresholds for the whole timeout.
Datalogging Stop Timeout	Milliseconds, evaluated every 10 ms. Default 300 ms. Zero stops at the next check. If any value recovers to its stop threshold or above, the delay resets.

With all start and stop thresholds set to zero, AUTO starts once armed and normally continues until stopped manually. Use sensible stop thresholds if automatic stopping is required.



ARM Logging command	Action
DISARM	Prevents an armed recording from starting on its trigger conditions.
STOP	Stops the current recording regardless of the trigger conditions.
MANUAL	Starts recording without waiting for the start thresholds.
AUTO	Arms recording and waits for all start conditions.
RELEASE	Releases stopped data to the downloadable cache.

Download and save

The USB-Tools indicator is **yellow** when armed/waiting, **green** while recording and **red** when stopped with data ready. Stop the recording; use RELEASE if required, then choose **USB-Tools → Download Logging**. Save the **.SD** file under the unit's serial-number directory and open it in **SView**.

Download and confirm the saved file before disconnecting or removing power. Arm again for the next recording.

USB memory-stick logging

USB-stick logging allows recording without a laptop connected. It uses the same Datalogging Content, Block Frequencies and start/stop maps as laptop logging.

Prepare and record

1. Use a reliable, low-latency USB memory stick formatted as **FAT32**, with enough free space for the session. Back up existing files before formatting. Use the adapter required by the SyvTCM USB connector.

2. Configure **Logging Mode = DATA**, select the required channels and rates, and set the start/stop thresholds. Program the configuration before the recording session.

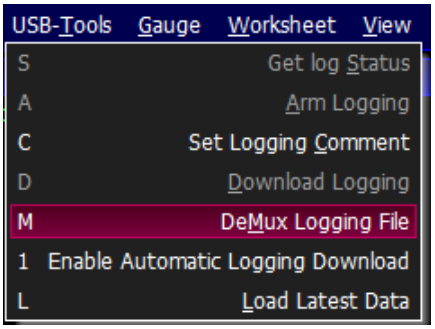
3. Connect the stick to SyvTCM. USB-stick recording automatically arms in **AUTO**; no separate SCal arming command is needed. Recording begins when all configured start thresholds are met.

4. End the recording using the configured stop conditions or an orderly shutdown. Wait for file writing to finish before removing the stick. Avoid removing it during recording.

> USB logs are saved as **.SMD** files. Keep the original files until conversion and review are complete. They may be zipped for transfer to support.

Convert .SMD files for SView

5. Connect the stick to the laptop. Open SCal **disconnected from the SyvTCM unit**, then choose **USB-Tools → Demux Logging File**.



6. Select the USB drive or folder containing the **.SMD** files and confirm. SCal converts the recordings into **.SD** files in its working/download directory under the TCM serial number. Note the save location reported by SCal.

7. Open the converted **.SD** file in **SView**. Check the time span, channel names and sensible data values before deleting the originals or starting a long recording session.

If a log is missing or incomplete, check FAT32 formatting, available capacity, the USB connection and whether the start thresholds were actually reached. Try a short recording at a lower rate to check the drive and conversion workflow.

Log channels and troubleshooting

Start with a short recording and review it in SView. Group the channels needed to explain the event; use the fastest rates for shift events and lower rates for slowly changing signals.

Suggested group	Items / purpose
Driver and motion	Rpm, VehicleSpeed, TpsMax, Pps, BrakeLight, PaddleUp and PaddleDown.
Range and gear	ShiftPos, GearModeReq, GearMode, Gear, TargetGear and GearShiftState. Compare driver request with gearbox response.
Engine torque	EngTrqEstOutputExt, EngTrqEstOutputPot, EngTrqDmdPps and EngTrqLim. Include the engine controller's delivered-torque data when available.
Acceleration	LongGCalculated when Calculate LongG from Delta Speed is Enabled; LongG when Disabled. Check acceleration and deceleration signs.
Shift support	GearBlipState and the configured ChangeLight / automatic-upshift monitoring items when investigating shift requests.
Clutch pressures	Clutch1Pressure and Clutch2Pressure where supported and refreshed by the installed controller.

> For non-MQB 1.61.1, pressure values become zero if polling is disabled or the reply is older than one second. Zero can mean unavailable data. Gearbox temperatures and input/output shaft speeds have no verified decoder here; do not treat their default values as measured feedback.

If recording does not behave as expected

Symptom	Check
No recording starts	Logging Mode = DATA; active blocks/channels; unit calibration/licence valid; recording armed; all three start thresholds reached.
Automatic stop never occurs	All three stop conditions must be true together. A value equal to its threshold resets the timeout. Zero thresholds normally require manual stop.
Flat / repeated values	Verify the source is configured and updating. Reduce the recording rate if it is faster than the source; increasing it cannot create new measurements.
Cannot open a USB log	Convert .SMD using Demux Logging File with SCal disconnected, then open the resulting .SD file in SView.

For support, retain the log, calibration, firmware/profile version, module serial number, TCM identification and a short description of the event with its time in the recording.

Updating firmware over USB

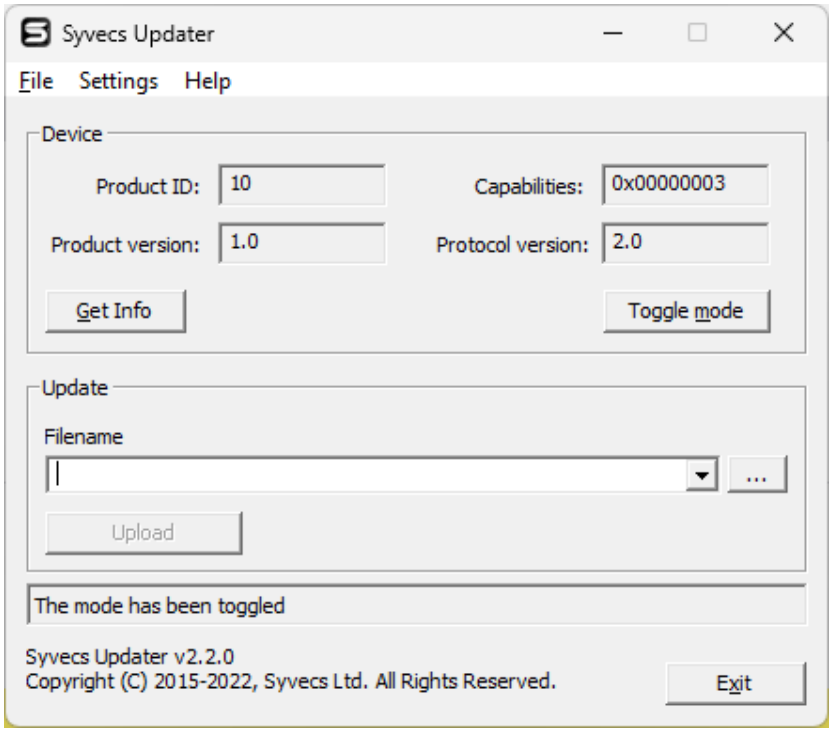
Use Syvecs Updater on a Windows PC with the correct SyvTCM .enc firmware supplied for your hardware and application. SyvTCM firmware files use the TCMCAN release name.

Before updating, connect with SCal and save the current SyvTCM calibration. Use a USB data cable matching the controller connector; a charging-only cable cannot update it.

1. Power down. Unplug the module from the vehicle loom and ensure it is fully powered down. Disconnect any SCal session.

2. Connect USB. Connect the controller to the Windows computer using a USB data cable. With vehicle power disconnected and SCal disconnected, the USB-powered controller enters bootloader mode.

3. Open Syvecs Updater. If the device has been connected to SCal, disconnect from SCal, then click **Toggle mode** in Syvecs Updater to put it into bootloader mode before flashing.



Syvecs Updater: use Toggle mode when required to enter bootloader mode. The status message confirms that the mode has been toggled.

This procedure updates the SyvTCM interface controller. Gearbox TCU reflashing is a separate procedure. Keep a separate record of the supplied licence key before updating, and check the Licence code after restoring the calibration.

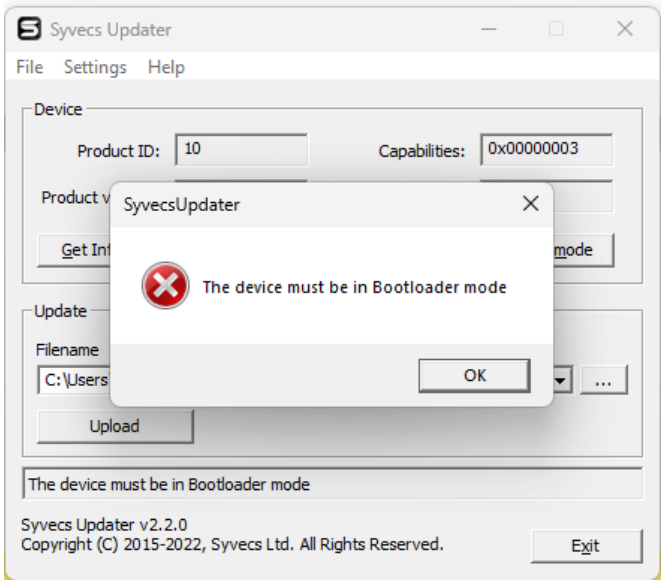
Uploading and confirming the update

4. Select the firmware. Click the **...** browse button beside Filename and select the updated **.enc** firmware file for your module.

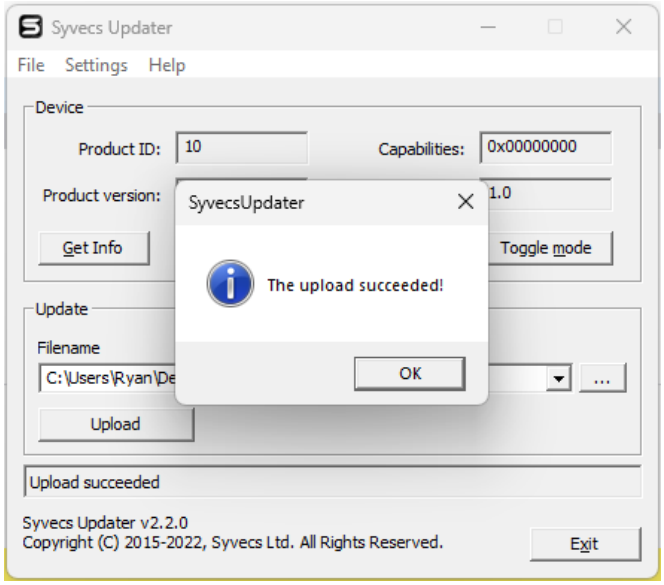
5. Upload. Click **Upload** and allow the update to finish. Keep the USB cable connected throughout the upload.

6. Confirm success. When flashing completes correctly, Syvecs Updater displays **“The upload succeeded!”** and the status line shows **“Upload succeeded”**. Click **OK**.

If “The device must be in Bootloader mode” appears: the device is **not in bootloader mode** and the upload has not succeeded. Click OK, disconnect from SCal if connected, then click **Toggle mode** in Syvecs Updater. Select the .enc file and click Upload again.



Bootloader mode required
Enter bootloader mode, then retry Upload.



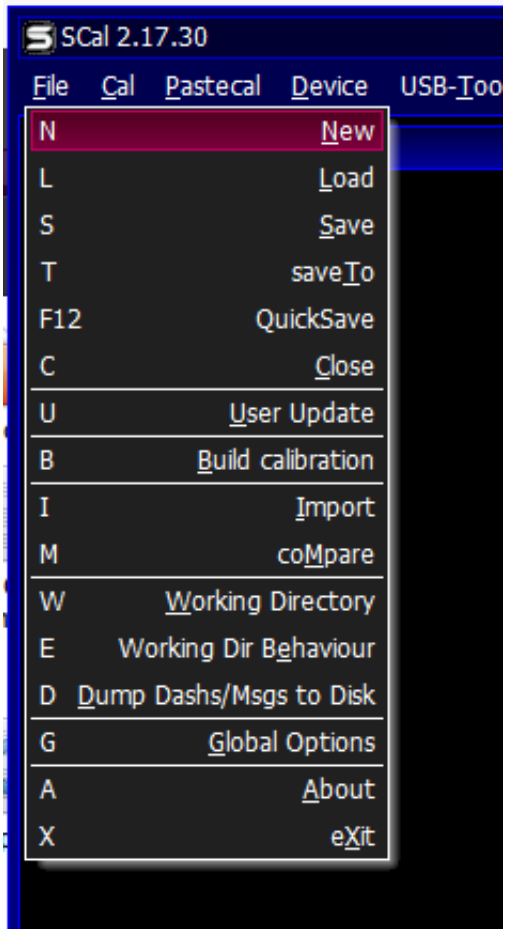
Upload succeeded
This prompt confirms a successful flash.

Calibration after a firmware update

7. Reconnect with SCal. After a successful upload, disconnect USB and restore normal vehicle power before reconnecting USB and SCal. If Device has no calibration appears, restore calibration as below.

If you have a calibration for the **new firmware level**, select **Load Calibration** (labelled **Load Disk Cal** in the example) and choose that file. If you do not, select **Program Defaults** to create a calibration for the new firmware.



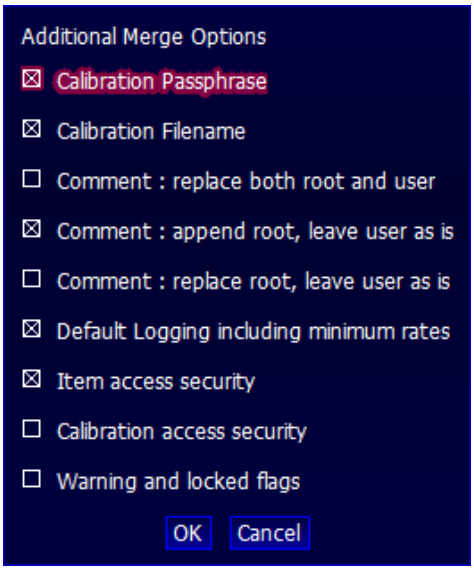


8. Import your previous settings. After programming defaults, select **File > Import** and choose your old calibration to bring its settings into the new firmware calibration.

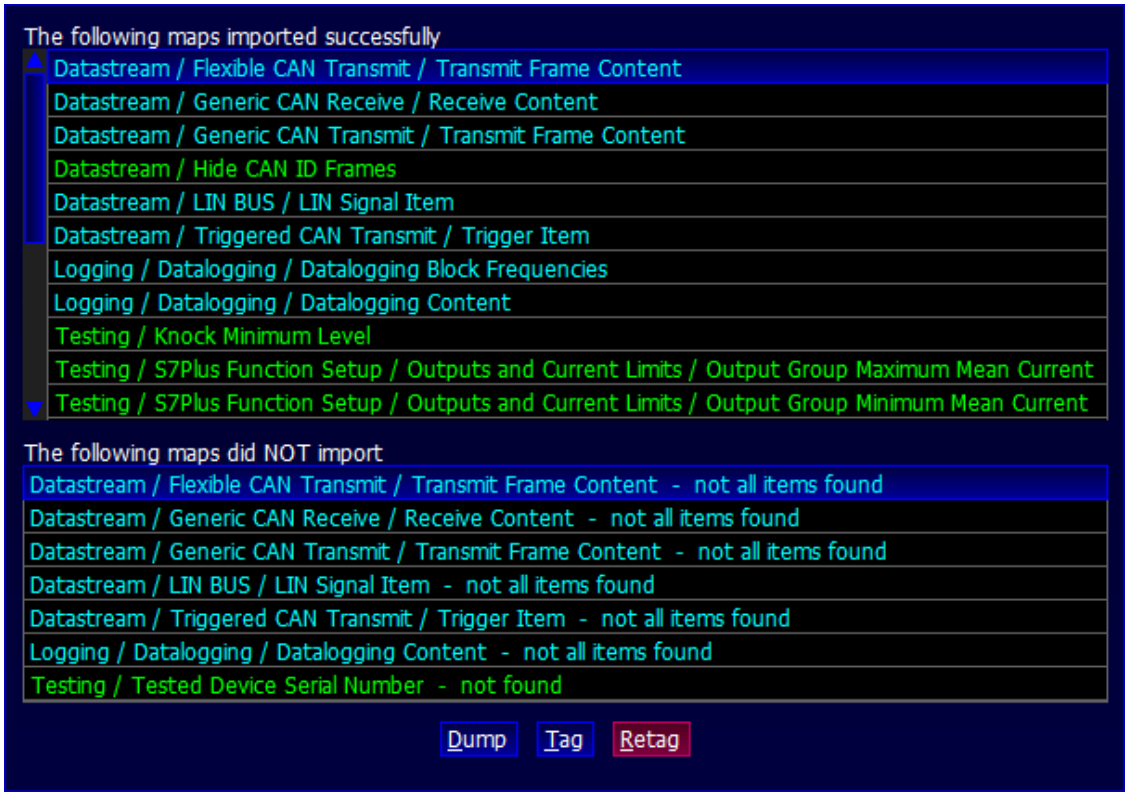
The screenshots illustrate the shared Syvecs update workflow. Device names, maps and pin assignments may differ; use the options for your SyvTCM controller and installation.

Import options and results

9. Choose what to copy. SCal presents import and merge options. The default selections are generally suitable; tick or untick the options to choose which settings you want to copy from the old calibration.

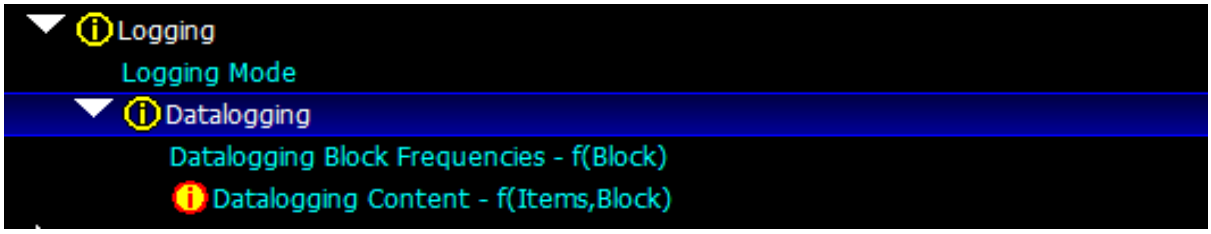


10. Review the import report. The results list shows maps that imported successfully and maps that did not import, including entries where not all items were found. Review the unsuccessful or partial imports and configure any missing settings in the new calibration.

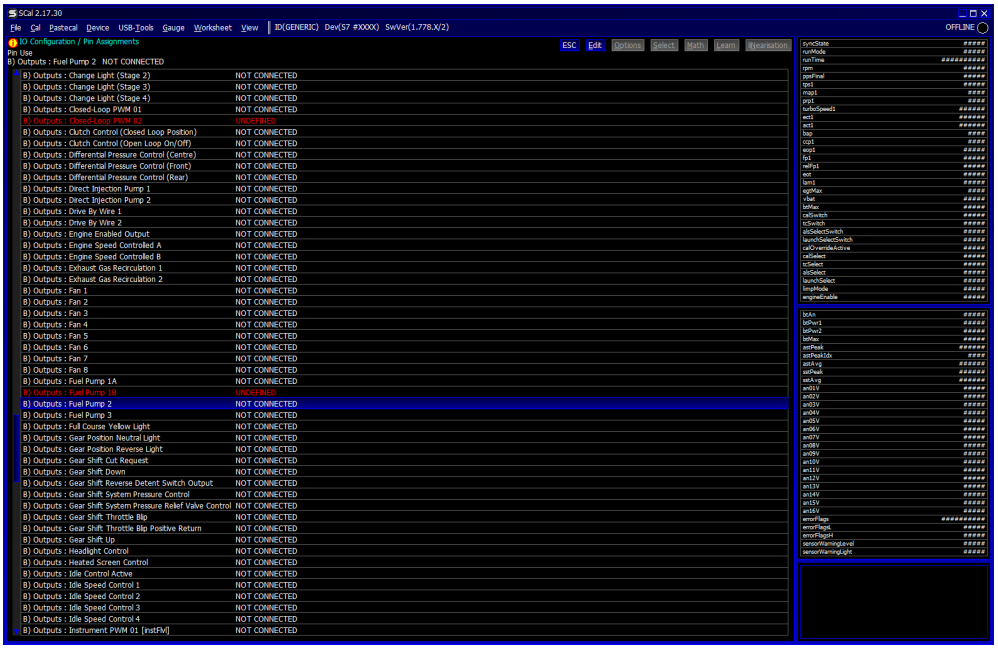


Review changed items and pin assignments

11. Check flagged maps and items. New maps and items that have changed are flagged for review. Open each flagged entry and check its settings before using the updated calibration.



12. Check pin assignments. Review **I/O Configuration > Pin Assignments**, where available. Newly added items may be set to **UNDEFINED**. Check every undefined assignment.



For each undefined item, assign the appropriate physical pin if it is used, or select **NOT CONNECTED** if it is unused. The example below shows the pin selection menu; use the choices applicable to your device and wiring.

