

Smart CAN Converter

User Manual

Seaside Customs Garage

firmware v2050+

1. Getting Started

Before first use:

- Connect the device to a USB port on your computer.
- Click Refresh — the COM port list will update automatically.
- Select the correct COM port and click Connect.
- Once connected, the application automatically reads the current settings of all MSG1-11 from the device.

Important: After disconnecting or resetting the device, any changes not saved with Write will be lost.

2. Screen Layout

The main working area is divided into two sections:

Section	Description
Message Editor	CAN frame parameters: ID, data bytes, interval, CRC, counters, parity.
Input Config	Configuration of the physical input assigned to the selected message.

Between the two sections, at the bottom of the editor, a preview bar is visible along with the TEST, Read, and Write buttons.

3. Message Selection — MSG1 to MSG11 Buttons

A row of buttons MSG1 ... MSG11 appears at the top of the working area. Clicking a button switches the editor to the selected message. Each message is configured independently.

MSG11 is special — it contains two independent panels (MSG11-A and MSG11-B) displayed side by side simultaneously. They support the same fields as MSG1-10, but without the Input Config panel.

4. Message Editor — Common to MSG1-MSG11

Enabling / Disabling Transmission

The Enable TX checkbox in the top-left corner enables transmission of this message on the CAN bus. When unchecked, the message is configured but not transmitted.

4.1 Basic Frame Parameters

Field	Description
ID	CAN frame identifier in HEX (e.g. 1A0). Range: 0x000-0x7FF (11-bit).

Field	Description
DLC	Number of data bytes: 0-8.
Data B0-B7	Data bytes in HEX. Entered manually or overwritten by Input Config.
Interval (ms)	How often the frame is repeated. E.g. 10 = 100 frames per second.
Run	Number of transmissions: -1 = unlimited, 0 = disabled, n = send n times.

4.2 CRC-8

Automatically calculates a CRC-8 checksum and writes it into the selected byte.

Field	Description
CRC (checkbox)	Enables CRC calculation.
Byte	Byte number (0-7) where the checksum will be written.
Algo	Algorithm: SAE J1850 (poly=1D, init=FF, xor=FF) or Custom.
Poly / Init / XOR	Custom algorithm parameters (active only when Custom is selected).

Example (Mercedes W204, ID 0x001): CRC enabled, Byte=0, Algo=SAE J1850.

4.3 Counter1 and Counter2

Two independent counters automatically written into selected frame bits on every transmission.

Field	Description
Counter1/2 (checkbox)	Enables the counter.
Offset	Starting bit in the frame (numbered from 0, left to right).
Len	Counter width in bits (e.g. 4 = counter 0-15).
Min / Max	Range. When Max is reached, the counter wraps back to Min.

Example: Counter1, Offset=0, Len=4, Min=0, Max=15 — classic 4-bit counter in bits 0-3 of byte B0.

4.4 Parity

Automatically calculates a parity bit and writes it to the specified position.

Field	Description
Parity (checkbox)	Enables parity calculation.
Type	Even or Odd.
Pos	Bit number (0-63) where the parity bit is written.
Start / End	Range of frame bits used for the calculation (e.g. 8-63 = bytes B1-B7).

4.5 Input Data to Bits Mapping

Defines which bits in the frame will receive the value read from the physical input (ADC, Hall sensor, NTC thermistor).

Field	Description
Start Bit	First bit in the frame where the input value is written.
End Bit	Last bit (inclusive). Number of bits = End - Start + 1.
Input Data to Bits 2	Second mapping (MSG9-10 only) — writes the same speed value into two different positions in the frame simultaneously. Enabled by the Enable checkbox.

4.6 Preview Bar and Action Buttons

A real-time frame preview is shown at the bottom of the editor, for example:

ID: 1A0 [8] FF 00 3C A4 00 00 00 00	
Button	Action
TEST	Starts simulation — the preview updates every 100 ms, animating counters, parity and CRC. Works without a connected device.
Read	Reads the current settings of this message from the device and loads them into the editor.
Write	Sends this message configuration to the device. Changes take effect immediately.

5. Input Config

The Input Config panel changes its content depending on the selected message. Below is a description for each MSG range.

5.1 MSG1-MSG6 — Button Input (Digital Input)

Each of these messages handles one digital input (button, relay, 0/3.3 V signal).

Pin assignment:

MSG	Pin
MSG1	PA2
MSG2	PA1
MSG3	PA0
MSG4	PA7
MSG5	PA6
MSG6	PA5

Configuration fields:

Field	Description
Stop on press	Checked: frame is transmitted continuously and stops when the button is pressed. Unchecked: frame is transmitted only while the button is held.
CAN Mapping Min/Max (HEX)	Value written to the frame when button is released (Min) and pressed (Max).
Scale / Offset	Value scaling before writing to the frame. Typically 1.0 / 0.
Button Mode: SHOT	Frame sent once on button press.
Button Mode: LOOP	Frame sent repeatedly while button is held (default).

5.2 MSG7-MSG8 — NTC Thermistor

Temperature measurement from an NTC sensor connected to an analog input pin.

Pin assignment:

MSG	Pin
MSG7	PA4
MSG8	PA3

Configuration fields:

Field	Description
Sensor Type	Built-in presets: NTC 10K Beta 3950, NTC 10K Beta 3435, NTC 100K Beta 4190, Custom.
R25 (Ohm)	Sensor resistance at 25 degrees C (e.g. 10000 for NTC 10K).
Beta (K)	Sensor Beta coefficient (e.g. 3950).

Field	Description
R pull-up (Ohm)	Pull-up resistor value in the voltage divider circuit (e.g. 10000).
Look-Up Table Generator	Opens the LUT calculator — generates a 256-entry ADC-to-temperature table and uploads it to firmware. Required before first use.
CAN Mapping Min/Max	Clamps the output value range written into the frame.
Scale / Offset	E.g. Scale=1.0, Offset=40 means CAN value = temperature + 40 (typical Mercedes format).

The LUT must be regenerated and uploaded after any change to the sensor parameters. Status is shown below the button: "LUT: Generated ✓" or "LUT: Not generated".

5.3 MSG9-MSG10 — Hall Speed Sensor

Speed or RPM measurement from a Hall effect sensor (digital pulse signal).

Pin assignment:

MSG	Pin
MSG9	PB0 (EXTI0)
MSG10	PB1 (EXTI1)

Configuration fields:

Field	Description
Pulses/Rev	Number of pulses per wheel/shaft revolution (e.g. 100).
Wheel diameter (mm)	Wheel circumference in mm (e.g. 2300 for a 195/65 R15 tyre). Used to convert revolutions to km/h.
Scale Factor	Multiplier for the value written into the frame (e.g. 100 = speed x 100).
Unit	Unit shown in the preview display: km/h, mph, RPM, Hz.
Calculated Speed	Live readout of the computed value based on the current input signal.
CAN Mapping Min/Max	Clamps the CAN output range (e.g. 0000-9C40 for 0-400 km/h x 100).
Input Data to Bits	Position in the frame where the computed speed is written.
Input Data to Bits 2	Optional second position in the same frame (Enable checkbox).

6. SETTINGS Tab

Option	Description
CAN Speed	Bus speed: 10-1000 kbps. Click Read to read from the device, Write to save.
Endianness	Byte order for multi-byte values generated by Input Config (ADC, Hall, NTC). Does not affect bytes entered manually in the B0-B7 fields.
Export All Settings	Saves the configuration of all MSG1-11 to a .json file.

Option	Description
Import All Settings	Loads configuration from a .json file and updates the editor.
Communication Log	Log window visible only in this tab — displays every sent and received command with a timestamp.

Endianness — Details

This setting applies exclusively to multi-byte values computed automatically by the device (Hall speed, NTC temperature, ADC value) and written into the frame via the Input Data to Bits fields.

Mode	Byte order	Example: value 0x1234 in bits 0-15
BIG (default)	MSB first	B0 = 12, B1 = 34
LITTLE	LSB first	B0 = 34, B1 = 12

Most Mercedes/BMW protocols use Big-Endian — switch to Little only if the target ECU requires reversed byte order.

7. Typical Workflow

- 1. Connect the device and click Connect.
- 2. Select a message (e.g. MSG1).
- 3. Enter the frame ID, DLC, and data bytes.
- 4. Configure CRC / Counter / Parity if required.
- 5. In Input Config, set up the physical input mapping.
- 6. Click TEST to verify the frame preview without hardware.
- 7. Click Write to upload the configuration to the device.
- 8. Repeat steps 2-7 for each message.
- 9. In SETTINGS -> Export, save a backup of the full configuration as a .json file.

8. Tips

- Configuration is stored in non-volatile memory on the device and is retained after power is removed.
- The exported .json file can be shared with another user. After import, click Write for each message to apply the settings.
- The TEST button works without a connected device — useful for verifying CRC logic and counter behaviour at the desk.
- The communication log (SETTINGS tab) shows raw SLCAN commands — useful for debugging.