

## Volvo

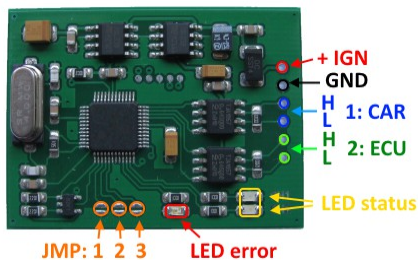
**CEM - 2**

**immo emulator**

**CAN, 500 kB**

**Usage:** VOLVO cars from 2005 to 2012: P2 Platform, S60/S80/V70/XC70/XC90, M32C based CEM, 500 kB CAN, no ABS\_ID used. Acts as a **CAN filter** between ECU and original CEM. Must store 6 bytes into emulator AND / OR modify ECU EEPROM.

**Installation:** install emulator in CAN wiring between CEM and ECU (cut CAN wires), CAN 1: CAR (CEM) side, CAN 2: ECU side, power it from main relay output. If you install emulator inside ECU it is good idea to install it in place of CAN EMI suppressor.



### Configuration and jumpers (JMP):

- JMP1: open to allow SYNC update, if short update is prohibited;
- JMP2: open for standalone mode (emulator acts as a CEM for ECU), short for standard mode;
- JMP3: open for default SYNC (579712864339 - used by Codecard as a default one), short – use custom SYNC stored into emulator EEPROM.

### Common alignment methods:

- method 1 – modify default SYNC into ECU EEPROM. Jumpers (solder bridges) must be: JMP1 short, JMP2 short, JMP3 open. Install emulator inside ECU and enjoy;
- method 2 – store necessary SYNC into emulator. JMP1 must be open to allow EEPROM updates, JMP3 shorted (use custom SYNC stored into emulator EEPROM), MBCan or any suitable CAN logger connected to emulator CAN 1 (CEM) side:

◦ Using MBCan: simply store necessary SYNC;

◦ Using CAN logger - speed 500kB, 11-bit id. To store SYNC (010203040506 here) must send frame:

`0x7FE 7 AA 01 02 03 04 05 06`

Response from emulator must look like:

`0x7FF 6 01 02 03 04 05 06`

To request actual SYNC from emulator, must send:

`0x7FE 7 55 00 00 00 00 00`

Emulator will respond like above, frame with SYNC data.

- Short JMP1 to prohibit SYNC updates. All configuration changes become active at next power-ON,
- If JMP2 is open, original messages from CEM are completely dropped and own ones are sent (standalone mode, no CEM). If JMP2 is shorted, original messages issued by CEM are modified to comply with ECU demands.

### LEDs on emulator board:

- **LEDstatus** – two leds, CAN1, CAN2 activity
- **LEDError** – CAN exchange error (stack overflow) / ECU authorization error. If everything is OK, must go off.

