

# FMC225 CAN adapters

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Easy steps to install and configure following CAN adapters on [FMC225](#) device:

- [LV-CAN200](#)
- [ALL-CAN300](#)
- [CAN-CONTROL](#)
- [ECAN01](#)
- [ECAN02](#)

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# Installing CAN adapter with FMC225 device

## Installing LV-CAN200/ALL-CAN300/CAN-CONTROL

You can watch [LV-CAN200/ALL-CAN300](#) installation video in our YouTube channel [here](#) or follow connection instructions below.

### Tools needed for installation

- [LV-CAN200/ALL-CAN300/CAN-CONTROL](#)
- Connection scheme (Please contact Teltonika Sales Representative and provide information about **vehicle manufacturer, model** and **year**.)
- [FMC225](#) device
- Pliers
- Quick splice connectors (If vehicle CAN bus wires are very thin CAN adapter wires should be connected directly)
- Plastic pry tool
- Zip ties

### Installation steps


1. Be ready with a vehicle **connection scheme** that you have received from a Teltonika Sales Representative.
2. **Check the scheme** for the current vehicle connection. Look for connectors matching **PINs numbers** and colors (may be different) according to connection scheme.
3. Connect CAN adapter with [FMC225](#):
  1. Connect CAN adapter **PIN 6 (Rx)** to **INPUT 6** of [FMC225](#).
  2. Connect CAN adapter **PIN 5 (Tx)** to **INPUT 5** of [FMC225](#).
4. Connect CAN adapter **CAN wires (CAN L, CAN H)** as specified in connection scheme.

 **Do not swap CAN L and CAN H lines.**  
**Not all CAN adapter wires may be used in vehicle.**

5. Connect CAN adapter **positive** and **ground** wires to the vehicle power supply lines or near [FMC225](#) power wires.

 **Do not swap power supply lines.**  
**Make sure that voltage does not exceed 30V.**

6. Switch vehicle **ignition to ACC** position. CAN adapter **LED diode** on the back should start **blinking**.
7. Configure CAN adapter to read CAN bus data or control vehicle by setting its **program number** - [CAN Adapter configuration](#)

 LV-CAN200/ALL-CAN300 connection example. This is not a connection diagram for your vehicle. Every vehicle has a specific scheme.



CAN-CONTROL connection example. This is not a connection diagram for your vehicle. Every vehicle has a specific scheme.

## Installing LV-CAN200/ALL-CAN300 + ECAN02

### Tools needed for installation

- [LV-CAN200/ALL-CAN300](#)
- Connection scheme (Please contact Teltonika Sales Representative and provide information about **vehicle manufacturer, model** and **year**.)
- [ECAN02](#) (Used for contactless connection. If **two CAN lines** need to be connected, **two ECAN02's** must be used.)
- [FMC225](#) device
- Pliers
- Quick splice connectors (If vehicle CAN bus wires are very thin CAN adapter wires should be connected directly)
- Plastic pry tool
- Zip ties

### Installation steps

1. Follow the same **1, 2, 3** installation steps as with [LV-CAN200/ALL-CAN300/CAN-CONTROL installation](#).
2. Connect the appropriate CAN bus pair of wires between the CAN adapter and [ECAN02](#):

If **CAN1 line** need to be connected as specified in the connection scheme:

1. Connect CAN adapter **CAN1 L** to **CAN L** of [ECAN02](#).
2. Connect CAN adapter **CAN1 H** to **CAN H** of [ECAN02](#).

If **CAN2 line** need to be connected as specified in the connection scheme:

1. Connect CAN adapter **CAN2 L** to **CAN L** of [ECAN02](#).
2. Connect CAN adapter **CAN2 H** to **CAN H** of [ECAN02](#).

 **Do not swap CAN L and CAN H lines.**  
**Not all CAN adapter wires may be used in vehicle.**

3. Fasten [ECAN02](#) **between vehicle CAN bus wires** according to the connection scheme. **Make sure CAN H and CAN L of vehicle corresponds to CAN H, CAN L markings on [ECAN02](#) PCB.**
4. Connect CAN adapter **positive** and **ground** wires to the vehicle power supply lines or near [FMC225](#) power wires.

- ❌ **Do not swap power supply lines.**  
**Make sure that voltage does not exceed 30V.**

5. Configure CAN adapter to read CAN bus data by setting its **program number** - [CAN Adapter configuration](#)

## CAN Adapter Configuration

### CAN Adapter program number selection

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CAN Adapter must be set to program number which depends on the vehicle model. **Needed program number is always written on CAN Adapter mounting scheme.** In order to be able to enter program number in adapter **Software date of CAN adapter must be newer than connection scheme date.** CAN adapter Software date can be checked:

- Via [Teltonika Configurator→Status→CAN Adapter](#)
- Via SMS command - [lvcانgetinfo](#)

The number of digits required to enter correct Program No. may vary depending on the Software and manufacture date of your CAN Adapter:

- [LV-CAN200 adapter changes](#)
- [ALL-CAN300 adapter changes](#)

### Entering via SMS command

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Required conditions:

- CAN adapter properly connected to [FMC225](#) device

CAN adapter program number can be set remotely, using SMS command. Send following **SMS command** to [FMC225](#) device:

- If you have set SMS login and password: `login pass lvcانsetprog X`
- If SMS login and password are not set leave two spaces before command: `lvcانsetprog X`

Command example: `lvcانsetprog 11434`

SMS response: `LVCAN ProgNum: 11434`

If during SMS command [FMC225](#) was in following Sleep mode:

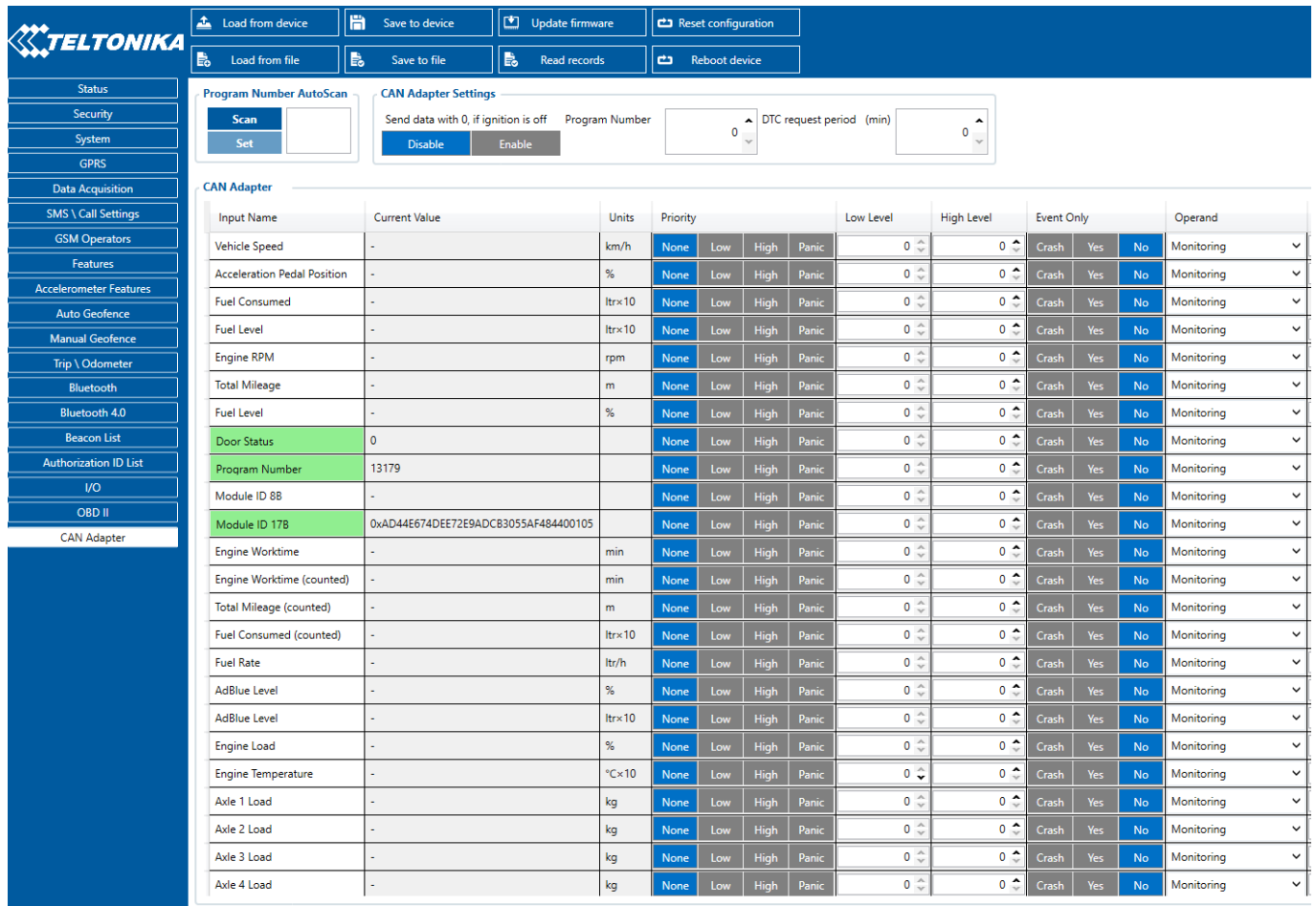
- [GPS Sleep](#) - Program No. will be set immediately.
- [Deep Sleep](#) - Program No. will be set after device wake up.
- [Online Deep Sleep](#) - Program No. will be set immediately.
- [Ultra Deep Sleep](#) - Program No. will be set after device wake up.

## Entering via Teltonika Configurator

Required conditions:

- CAN adapter properly connected to [FMC225](#) device

CAN adapter program number can be set via [Teltonika Configurator](#) → (1) **CAN Adapter** → (2) **Program Number**. When program number is entered press  (3) **Save to device** button that saves the entered program number into [FMC225](#).



The screenshot shows the Teltonika Configurator interface. The 'CAN Adapter' section is active, and the 'Program Number' field is highlighted in green. The 'Save to device' button is highlighted in blue. The 'CAN Adapter Settings' section shows 'Send data with 0, if ignition is off' set to 'Disable' and 'DTC request period (min)' set to 0.

Input Name	Current Value	Units	Priority	Low Level	High Level	Event Only	Operand
Vehicle Speed	-	km/h	None Low High Panic	0	0	Crash Yes No	Monitoring
Acceleration Pedal Position	-	%	None Low High Panic	0	0	Crash Yes No	Monitoring
Fuel Consumed	-	ltr×10	None Low High Panic	0	0	Crash Yes No	Monitoring
Fuel Level	-	ltr×10	None Low High Panic	0	0	Crash Yes No	Monitoring
Engine RPM	-	rpm	None Low High Panic	0	0	Crash Yes No	Monitoring
Total Mileage	-	m	None Low High Panic	0	0	Crash Yes No	Monitoring
Fuel Level	-	%	None Low High Panic	0	0	Crash Yes No	Monitoring
Door Status	0		None Low High Panic	0	0	Crash Yes No	Monitoring
<b>Program Number</b>	<b>13179</b>		None Low High Panic	0	0	Crash Yes No	Monitoring
Module ID 8B	-		None Low High Panic	0	0	Crash Yes No	Monitoring
<b>Module ID 17B</b>	<b>0xAD44E674DEE72E9ADC83055AF484400105</b>		None Low High Panic	0	0	Crash Yes No	Monitoring
Engine Worktime	-	min	None Low High Panic	0	0	Crash Yes No	Monitoring
Engine Worktime (counted)	-	min	None Low High Panic	0	0	Crash Yes No	Monitoring
Total Mileage (counted)	-	m	None Low High Panic	0	0	Crash Yes No	Monitoring
Fuel Consumed (counted)	-	ltr×10	None Low High Panic	0	0	Crash Yes No	Monitoring
Fuel Rate	-	ltr/h	None Low High Panic	0	0	Crash Yes No	Monitoring
AdBlue Level	-	%	None Low High Panic	0	0	Crash Yes No	Monitoring
AdBlue Level	-	ltr×10	None Low High Panic	0	0	Crash Yes No	Monitoring
Engine Load	-	%	None Low High Panic	0	0	Crash Yes No	Monitoring
Engine Temperature	-	°C×10	None Low High Panic	0	0	Crash Yes No	Monitoring
Axle 1 Load	-	kg	None Low High Panic	0	0	Crash Yes No	Monitoring
Axle 2 Load	-	kg	None Low High Panic	0	0	Crash Yes No	Monitoring
Axle 3 Load	-	kg	None Low High Panic	0	0	Crash Yes No	Monitoring
Axle 4 Load	-	kg	None Low High Panic	0	0	Crash Yes No	Monitoring

## Entering manually

Required conditions:

- CAN adapter properly connected to [FMC225](#) device
- Vehicle ignition must be ON

Depending on the used CAN Adapter, the length of the setup sequence will vary.

Steps to set program number:



LV-CAN200, ALL-CAN300 back



CAN-CONTROL back

For <a href="#">ALL-CAN300</a> <a href="#">LV-CAN200</a> 3 digit	For <a href="#">ALL-CAN300</a> <a href="#">LV-CAN200</a> 4 digit	For <a href="#">LV-CAN200</a> <a href="#">CAN-CONTROL</a> 5 digit	<ol style="list-style-type: none"><li>1. Hold SWITCH down until LED starts blinking.</li><li>2. Release the SWITCH.</li><li>3. Then LED starts blinking and counting first digit of program number (one blink means digit 1, two blinks mean digit 2 etc). To stop counter, push SWITCH.</li><li>4. Release the SWITCH, then LED starts blinking and counting second digit of program number. To stop counter, push SWITCH.</li><li>5. Release the SWITCH, then LED starts blinking and counting third digit on program number. To stop counter, push SWITCH.</li><li>6. Release the SWITCH, then LED starts blinking and counting fourth digit on program number. To stop counter, push SWITCH.</li><li>7. Release the SWITCH, then LED starts blinking and counting fifth digit on program number. To stop counter, push SWITCH.</li><li>8. Release SWITCH, if programming is successful LED will blink 10 times.</li></ol>
All Devices			

## FMC225 CAN Adapter parameters configuration

### Teltonika Configurator

CAN Adapter configuration can be performed using [Teltonika Configurator](#) via **Micro-USB cable** or **Bluetooth connection** when CAN Adapter is connected to the vehicle.

When [FMC225](#) is connected to the CAN Adapter, user can see all information that is received from the vehicle in [Teltonika Configurator](#) → **Status** → **CAN Adapter** tab or [Teltonika Configurator](#) →

**CAN Adapter** section. In **Status → CAN Adapter** tab you can see information about the CAN adapter and its readable parameters. In **CAN Adapter** section you can configure CAN Adapter and see incoming CAN bus data highlighted by **green** background color. Incoming data in both sections is automatically refreshed every 5 seconds. CAN bus data which should be readable from your vehicle is provided in the "CAN Adapter supported vehicles list", which you can get from Teltonika Sales Representative.

The CAN Adapter I/O element can be configured like any other I/O element in [Teltonika Configurator](#). All information about I/O element parameters description is in section [I/O settings](#).

The screenshot shows the Teltonika Configurator interface. At the top, there are buttons for 'Load from device', 'Save to device', 'Update firmware', and 'Reset configuration'. Below these are buttons for 'Load from file', 'Save to file', 'Read records', and 'Reboot device'. The main area is divided into two sections: 'Program Number AutoScan' and 'CAN Adapter Settings'. The 'CAN Adapter Settings' section includes a checkbox for 'Send data with 0, if ignition is off', a 'Program Number' dropdown set to '0', and a 'DTC request period (min)' dropdown set to '0'. Below this is a table of CAN Adapter parameters.

Input Name	Current Value	Units	Priority	Low Level	High Level	Event Only	Operand
Vehicle Speed	-	km/h	None Low High Panic	0	0	Crash Yes No	Monitoring
Acceleration Pedal Position	-	%	None Low High Panic	0	0	Crash Yes No	Monitoring
Fuel Consumed	-	ltr×10	None Low High Panic	0	0	Crash Yes No	Monitoring
Fuel Level	-	ltr×10	None Low High Panic	0	0	Crash Yes No	Monitoring
Engine RPM	-	rpm	None Low High Panic	0	0	Crash Yes No	Monitoring
Total Mileage	-	m	None Low High Panic	0	0	Crash Yes No	Monitoring
Fuel Level	-	%	None Low High Panic	0	0	Crash Yes No	Monitoring
Door Status	0		None Low High Panic	0	0	Crash Yes No	Monitoring
Program Number	13179		None Low High Panic	0	0	Crash Yes No	Monitoring
Module ID 88	-		None Low High Panic	0	0	Crash Yes No	Monitoring
Module ID 178	0xAD44E674DEE72E9ADC83055AF484400105		None Low High Panic	0	0	Crash Yes No	Monitoring
Engine Worktime	-	min	None Low High Panic	0	0	Crash Yes No	Monitoring
Engine Worktime (counted)	-	min	None Low High Panic	0	0	Crash Yes No	Monitoring
Total Mileage (counted)	-	m	None Low High Panic	0	0	Crash Yes No	Monitoring
Fuel Consumed (counted)	-	ltr×10	None Low High Panic	0	0	Crash Yes No	Monitoring
Fuel Rate	-	ltr/h	None Low High Panic	0	0	Crash Yes No	Monitoring
AdBlue Level	-	%	None Low High Panic	0	0	Crash Yes No	Monitoring
AdBlue Level	-	ltr×10	None Low High Panic	0	0	Crash Yes No	Monitoring
Engine Load	-	%	None Low High Panic	0	0	Crash Yes No	Monitoring
Engine Temperature	-	°C×10	None Low High Panic	0	0	Crash Yes No	Monitoring
Axle 1 Load	-	kg	None Low High Panic	0	0	Crash Yes No	Monitoring
Axle 2 Load	-	kg	None Low High Panic	0	0	Crash Yes No	Monitoring
Axle 3 Load	-	kg	None Low High Panic	0	0	Crash Yes No	Monitoring
Axle 4 Load	-	kg	None Low High Panic	0	0	Crash Yes No	Monitoring

When using the offline configuration method user can select which CAN data (according to vehicle) will be sent directly to the server without connection to adapter.

### Send data with 0, if ignition is off

Depending on CAN Adapter I/O parameters and ignition status, [FMC225](#) can send locked (last known) CAN Adapter I/O and active (real-time) parameters values or reset values to 0.

This is a close-up of the 'CAN Adapter Settings' configuration panel. It features a checkbox labeled 'Send data with 0, if ignition is off' which is currently checked. To its right is a 'Program Number' dropdown menu showing the value '0'. Further right is a 'DTC request period (min)' dropdown menu also showing the value '0'. At the bottom left of the panel are two buttons: 'Disable' (highlighted in blue) and 'Enable' (greyed out).

When ignition is off, CAN Adapter I/O parameters values sent to server are:

<b>CAN Adapter I/O element</b>	<b>Status</b>
<b>Vehicle Speed</b>	reset
<b>Accelerator pedal position</b>	reset
<b>Total fuel used</b>	lock
<b>Fuel level (liters)</b>	lock
<b>Engine RPM</b>	reset
<b>Total mileage</b>	lock
<b>Fuel level (%)</b>	lock
<b>Program number</b>	lock
<b>Module ID</b>	lock
<b>Engine Work Time</b>	lock
<b>Engine Work Time (counted)</b>	lock
<b>Total Mileage (counted)</b>	lock
<b>Fuel Consumed (counted)</b>	lock
<b>Fuel Rate</b>	reset
<b>Program number</b>	lock
<b>AdBlue Level (%)</b>	lock
<b>AdBlue Level (liters)</b>	lock
<b>Engine Load</b>	reset
<b>Engine Temperature</b>	active
<b>Axle 1 Load</b>	lock
<b>Axle 2 Load</b>	lock
<b>Axle 3 Load</b>	lock
<b>Axle 4 Load</b>	lock
<b>Axle 5 Load</b>	lock
<b>Control State Flags</b>	active
<b>Agricultural Machinery Flags</b>	active
<b>Harvesting Time</b>	lock
<b>Area of Harvest</b>	reset
<b>Mowing Efficiency</b>	active
<b>Grain Mown Volume</b>	active
<b>Grain Moisture</b>	active
<b>Harvesting Drum RPM</b>	reset
<b>Gap Under Harvesting Drum</b>	active
<b>Security State Flags</b>	active
<b>Tachograph Total Vehicle Distance</b>	lock



<b>Trip Distance</b>	reset
<b>Tachograph Vehicle Speed</b>	reset
<b>Tachograph Driver Card Presence</b>	active
<b>Driver1 States</b>	active
<b>Driver2 States</b>	active
<b>Driver1 Continuous Driving Time</b>	active
<b>Driver2 Continuous Driving Time</b>	active
<b>Driver1 Cumulative Break Time</b>	active
<b>Driver2 Cumulative Break Time</b>	active
<b>Driver1 Selected Activity Duration</b>	active
<b>Driver2 Selected Activity Duration</b>	active
<b>Driver1 Cumulative Driving Time</b>	active
<b>Driver2 Cumulative Driving Time</b>	active

## SMS Configuration

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All CAN Adapter IO elements can be configured remotely via SMS commands.

### SMS/GPRS Commands

CAN Adapters have several dedicated SMS/GPRS commands.

SMS command structure:

<SMS login><space><SMS password><space><command><space><value>

SMS command [lvcangetinfo](#) example:

- If you have set SMS login and password: login pass lvcangetinfo
- If SMS login and password are not set leave two spaces before command: `lvcangetinfo`

GPRS commands require [Codec 12](#) protocol.

For more SMS commands please see [SMS/GPRS command list](#)

<u>COMMAND</u>	<u>DESCRIPTION</u>	<u>RESPONSE</u>
----------------	--------------------	-----------------

lvcansetprog #	Set program number to CAN Adapter that is connected to <a href="#">FMC225</a> . # - three digit number that identity vehicle.	Yes
lvcanimpletacho #	Add or remove simpletacho start byte. # - 0 or 1 (0 - don't add start byte, 1 - add start byte).	No
lvcangetprog	Get program number from CAN Adapter that is connected to <a href="#">FMC225</a> .	Yes
<a href="#">lvcangetinfo</a>	Get information about connected CAN Adapter	Yes
<a href="#">lvcanclear #</a>	Clear Total Mileage (counted), Engine Work Time (counted), Fuel Consumed (counted) parameters values. # - parameter (0 - Engine work time (counted), 1 - Fuel Consumed (counted), 2 - Vehicle Mileage (counted)).	Yes
allcanmode	Turn on <a href="#">ALL-CAN300</a> mode.	Yes
lvcanmode	Turn on <a href="#">LV-CAN200</a> mode.	Yes
<a href="#">lvcanfaultcodes</a>	Read DTC fault codes	Yes

#### **Added from version [03.25.16.Rev.280](#)**

<a href="#">lvcancheck</a>	Get status of CAN line connections. Outputs all available CAN line connection status.	Yes
<a href="#">lvcanreset</a>	Reset external CAN adapter using serial commands or internal CAN chip	Yes
<a href="#">lvcanrefresh</a>	Connect to FOTA WEB and update CAN information	Yes

#### **CAN-CONTROL specific commands**

lvcanopenalldoors	Open [unlock] all doors	Yes
lvcanclosealldoors	Close [lock] all doors	Yes
lvcanopentrunk	Open [unlock] trunk	Yes
lvcanblockengine	Block vehicle engine ( <i>if command is <b>not</b> supported, please, visit <a href="#">FAQ</a></i> )	Yes
lvcanunblockengine	Unblock vehicle engine ( <i>if command is <b>not</b> supported, please, visit <a href="#">FAQ</a></i> )	Yes
lvcanturninglights	One flash of all turn lights ordered trough accidental / blinking turn light switch	Yes

## **CAN Adapter software update Over The Air**

The software of CAN adapters [LV-CAN200](#), [ALL-CAN300](#) and [CAN-CONTROL](#) can now be updated Over The Air by using [FOTA WEB](#). The feature is also supported by our fresh [FMB140](#) device which has a built-in CAN-bus reading adapter. Upgrading the software of a CAN adapter will add more program numbers, thus, more vehicle models will be supported.

**Please note**, that only the newer version of [LV-CAN200](#) and [ALL-CAN300](#) CAN adapters support this feature. The version of the CAN adapter can be checked by sending an SMS command [lvcangetinfo](#). If, in the response message, "SWRev:" is **145**, the CAN adapter is older and if it is

**245**, the adapter is newer. It does not apply to [CAN-CONTROL](#) - all [CAN-CONTROL](#) adapters support firmware updates over the air.

In order to update your device's firmware please follow a quick and simple step-by-step guide which is below. The procedure is the same for all devices.

- [FMC225](#) device, which is connected to the CAN adapter (or [FMB140](#) which has an internal CAN adapter), must be registered in FOTA WEB - device's model, firmware version, serial number, and other information must be shown.
- [FMC225](#) device must have a correct firmware version uploaded. Currently, this feature is supported with base firmware since version **03.25.15.Rev.143**. Once a device with the correct firmware version connects to [FOTA WEB](#) on the next scheduled connection (or instant connection, initiated by an SMS command *web\_connect*), a small, blue, CAN adapter logo will appear before to the device's IMEI:



- A current version of the CAN adapter software can be checked by pressing on the device information row. Detailed information will be shown on the right side of fleet management device details. All available details of the [FMC225](#) device are listed in one window:



- If the software is not up-to-date it can be updated. A check-box needs to be ticked.



- Then the **Create task** button pressed:



- Finally, **Update CAN adapter** selected:



- Once the software update task has been assigned, it can be seen in the main window. Please note, that uploading will start after the next scheduled connection to [FOTA WEB](#) (or instant connection, initiated by an SMS command *web\_connect*):



- When the update is finished, a new software version can be seen in the details window after the next scheduled connection to [FOTA WEB](#) (or instant connection, initiated by an SMS command *web\_connect*):



# CAN Adapter State Flags

CAN Adapters receive data about the states of various systems within the vehicle, and send them as flags to [FMC225](#). [FMC225](#) device stores these flags in hexadecimal format, as one variable. **Note!** To retrieve all flags, Firmware version **03.27.07.Rev.00** or newer must be used. Below are the tables of flags that are kept by [LV-CAN200](#), [ALL-CAN300](#), [CAN-CONTROL](#) and information how to retrieve them:

## Security state Flags P2

Byte	Bit	Value bitmasks	LVCAN	ALLCAN	CAN-CONTROL
0	0	0x00 - CAN1 not connected, connection not required,	☐	☐	☐
		0x01 - CAN1 connected, currently no data is received			
		0x02 - CAN1 not connected, needs connection			
0	2	0x03 - CAN1 connected, currently data is received	☐	☐	☐
		0x00 - CAN2 not connected, connection not required,			
		0x01 - CAN2 connected, currently no data is received			
0	4	0x02 - CAN2 not connected, needs connection	☐	☐	☐
		0x03 - CAN2 connected, currently data is received			
		0x00 - CAN3 not connected, connection not required,			
1	8	0x01 - CAN3 connected, currently no data is received	☐	☐	☐
		0x02 - CAN3 not connected, needs connection			
		0x03 - CAN3 connected, currently data is received			
1	8	0x01 - request to lock the engine (activation after attempt to restart the engine)		☐	☐
1	9	0x02 - status of the hazard warning lights switch active		☐	☐
1	10	0x04 - factory armed			☐
2	17	0x02 - electric engine is working (information available only when the ignition is on)		☐	☐
2	18	0x04 - battery charging is on (from 03.25.15.Rev.142)		☐	☐
2	19	0x08 - charging wire is plugged (from 03.25.15.Rev.142)		☐	☐
2	20	0x10 - vehicle working mode, 1- business mode, 0 - private mode		☐	
2	21	0x20 - bit appears when any operate button in car was put. This bit is reset if the button is released		☐	
2	22	0x40 - bit appears when immobilizer is in service mode		☐	
2	23	0x80 - immobilizer, bit appears during introduction of a programmed sequence of keys in the car		☐	
3	24	0x01 - the key is in ignition lock		☐	☐
3	25	0x02 - ignition on	☐	☐	☐
3	26	0x04 - dynamic ignition on		☐	
3	27	0x08 - webasto		☐	
3	28	0x10 - car is closed		☐	☐
3	29	0x20 - car is closed by factory's remote control or module command		☐	☐
3	30	0x40 - factory installed alarm system is actuated (is in panic mode)		☐	☐
3	31	0x80 - factory installed alarm system is emulated by module		☐	☐
4	32	0x01 - parking activated (automatic gearbox)		☐	☐

4	34	0x04 - neutral activated (automatic gearbox)			
4	35	0x08 - drive activated (automatic gearbox)			
4	36	0x10 - handbrake is actuated (information available only with ignition on)			
4	37	0x20 - footbrake is actuated (information available only with ignition on)			
4	38	0x40 - Engine is working (information available only when the ignition on)			
4	39	0x80 - reverse is on			
5	40	0x01 - front left door opened			
5	41	0x02 - front right door opened			
5	42	0x04 - rear left door opened			
5	43	0x08 - rear right door opened			
5	44	0x10 - engine cover opened			
5	45	0x20 - trunk door opened			
5	46	0x40 - roof opened			
		Low nibble (mask 0x0F value)			
		0x01 - car was closed by the factory's remote control			
		0x02 - car was opened by the factory's remote control			
6	48	0x03 - trunk cover was opened by the factory's remote control			
		0x04 - module has sent a rearming signal			
		0x05 - car was closed three times by the factory's remote control			
6	52	High nibble (mask 0xF0 bit)0x80 - CAN module goes to sleep mode			

## Security State Flags P4

Byte	Bit	Value bitmasks	LVCAN	ALLCAN	CAN-CONTROL
0	0	0x00 - CAN1 connected, currently no data is received			
		0x01 - CAN1 connected, currently data is received			
		0x02 - CAN1 not connected, needs connection			
		0x03 - CAN1 not connected does not need connection			
0	2	0x00 - CAN2 connected, currently no data is received			
		0x01 - CAN2 connected, currently data is received			
		0x02 - CAN2 not connected, needs connection			
		0x03 - CAN2 not connected does not need connection			
0	4	0x00 - CAN3 connected, currently no data is received			
		0x01 - CAN3 connected, currently data is received			
		0x02 - CAN3 not connected, needs connection			
		0x03 - CAN3 not connected does not need connection			
1	8	0x01 - ignition on			
1	9	0x02 - key in ignition lock			
1	10	0x04 - webasto			
1	11	0x08 - engine is working			
1	12	0x10 - standalone engine			
1	13	0x20 - ready to drive			
1	14	0x40 - engine is working on CNG			
1	15	0x80 - work mode (0 - private, 1 - company)			

2	16	0x01 - operator is present		<input type="checkbox"/>	
2	17	0x02 - interlock active		<input type="checkbox"/>	
2	18	0x04 - handbrake is active		<input type="checkbox"/>	<input type="checkbox"/>
2	19	0x08 - footbrake is active		<input type="checkbox"/>	<input type="checkbox"/>
2	20	0x10 - clutch is pushed		<input type="checkbox"/>	
2	21	0x20 - status of the hazard warning lights switch active		<input type="checkbox"/>	<input type="checkbox"/>
2	22	0x40 - front left door opened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	23	0x80 - front right door opened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	24	0x01 - rear left door opened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	25	0x02 - rear right door opened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	26	0x04 - trunk door opened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	27	0x08 - engine cover opened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	28	0x10 - charging wire is plugged		<input type="checkbox"/>	<input type="checkbox"/>
3	29	0x20 - battery charging on		<input type="checkbox"/>	<input type="checkbox"/>
3	30	0x40 - electric engine is working		<input type="checkbox"/>	<input type="checkbox"/>
3	31	0x80 - car is closed with factory remote control		<input type="checkbox"/>	<input type="checkbox"/>
4	32	0x01 - car is closed		<input type="checkbox"/>	<input type="checkbox"/>
4	33	0x02 - factory installed alarm is active		<input type="checkbox"/>	<input type="checkbox"/>
4	34	0x04 - emulated alarm is active		<input type="checkbox"/>	<input type="checkbox"/>
4	35	0x08 - signal of closing with factory remote control was sent		<input type="checkbox"/>	<input type="checkbox"/>
4	36	0x10 - signal of opening with factory remote control was sent		<input type="checkbox"/>	<input type="checkbox"/>
4	37	0x20 - rearm signal was sent		<input type="checkbox"/>	<input type="checkbox"/>
4	38	0x40 - trunk was opened with remote control		<input type="checkbox"/>	<input type="checkbox"/>
4	39	0x80 - CAN module is in SLEEP mode	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	40	0x01 - signal of closing with factory remote control was sent 3 times		<input type="checkbox"/>	
5	41	0x02 - parking is active		<input type="checkbox"/>	<input type="checkbox"/>
5	42	0x04 - reverse is active		<input type="checkbox"/>	<input type="checkbox"/>
5	43	0x08 - neutral is active		<input type="checkbox"/>	<input type="checkbox"/>
5	44	0x10 - drive is active		<input type="checkbox"/>	<input type="checkbox"/>
5	45	0x20 - engine lock active			<input type="checkbox"/>
5	46	0x40 - request to lock the engine (activation after attempt to restart the engine)			<input type="checkbox"/>
5	47	0x80 - factory armed			<input type="checkbox"/>
6	48	0x01 - roof opened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Control State Flags P2 & P4

Control State Flags P2					Control State Flags P4						
Byte	Bit	Value bitmasks	LVCAN	ALLCAN	CAN-CONTROL	Byte	Bit	Value bitmasks	LVCAN	ALLCAN	CAN-CONTROL
0	0	0x01 STOP				0	0	0x01 - parking lights turned on			
0	1	0x02 oil pressure / level				0	1	0x02 - dipped headlights turned on			
0	2	0x04 coolant liquid temperature / level				0	2	0x04 - full beam headlights turned on			
0	3	0x08 handbrake system				0	3	0x08 - rear fog lights turned on			
0	4	0x10 battery not charging				0	4	0x10 - front fog lights turned on			
0	5	0x20 AIRBAG				0	5	0x20 - additional front lights turned on			
0	6	0x40 EPS (electric power steering)				0	6	0x40 - additional rear lights turned on			
0	7	0x80 ESP (electronic stability program)				0	7	0x80 - light signal turned on			
1	8	0x01 CHECK ENGINE (MIL)				1	8	0x01 - air conditioning turned on			
1	9	0x02 lights failure				1	9	0x02 - cruise control turned on			
1	10	0x04 low tire pressure				1	10	0x04 - automatic retarder turned on			
1	11	0x08 wear of brake pads				1	11	0x08 - manual retarder turned on			
1	12	0x10 warning				1	12	0x10 - driver's seatbelt fastened			
1	13	0x20 ABS				1	13	0x20 - front passenger's seatbelt fastened			
1	14	0x40 low fuel				1	14	0x40 - rear left passenger's seatbelt fastened			
1	15	0x80 maintenance required				1	15	0x80 - rear right passenger's seatbelt fastened			
2	16	0x01 ESP indicator				2	16	0x01 - rear centre passenger's seatbelt fastened			
2	17	0x02 glow plug indicator				2	17	0x02 - front passenger is present			
2	18	0x04 FAP				2	18	0x04 - PTO is on			
2	19	0x08 electronics power control				2	19	0x08 - front differential locked			
2	20	0x10 parking lights				2	20	0x10 - rear differential locked			
2	21	0x20 dipped headlights				2	21	0x20 - central differential (4HI) locked			
2	22	0x40 full beam headlights				2	22	0x40 - central differential with reductor (4LO) locked			
2	23	0x80 front foglights				2	23	0x80 - trailer axle 1 lift active			
3	24	0x01 ready to drive				3	24	0x01 - trailer axle 2 lift active			
3	25	0x02 cruise control									
3	26	0x04 automatic retarder									
3	27	0x08 manual retarder									
3	28	0x10 air conditioning									
3	29	0x20 rear foglights									
3	30	0x40 passenger's seat belt									
3	31	0x80 driver's seat belt									

## Indicator State Flags P4

Byte	Bit	Value bitmasks	LVCAN	ALLCAN	CAN-CONTROL
0	0	0x01 - CHECK ENGINE (MIL) indicator turned on			
0	1	0x02 - ABS indicator turned on			
0	2	0x04 - ESP indicator turned on			
0	3	0x08 - ESP is turned off			
0	4	0x10 - STOP indicator turned on			
0	5	0x20 - oil pressure / level indicator turned on			
0	6	0x40 - coolant liquid temperature / level indicator turned on			
0	7	0x80 - battery not charging indicator turned on			



1	8	0x01 - handbrake system indicator turned on		
1	9	0x02 - AIRBAG indicator turned on		
1	10	0x04 - EPS (Electric Power Steering) indicator turned on		
1	11	0x08 - warning indicator turned on		
1	12	0x10 - lights failure indicator turned on		
1	13	0x20 - low tire pressure indicator turned on		
1	14	0x40 - wear of brake pads indicator turned on		
1	15	0x80 - low fuel level indicator turned on		
2	16	0x01 - maintenance required indicator turned on		
2	17	0x02 - glow plug indicator turned on		
2	18	0x04 - FAP indicator turned on		
2	19	0x08 - EPC (Electronic Power Control) indicator turned on		
2	20	0x10 - engine oil filter plugged indicator turned on		
2	21	0x20 - low engine oil pressure indicator turned on		
2	22	0x40 - too high engine oil temperature indicator turned on		
2	23	0x80 - low coolant level indicator turned on		
3	24	0x01 - hydraulic system oil filter plugged indicator turned on		
3	25	0x02 - hydraulic system low pressure indicator turned on		
3	26	0x04 - hydraulic oil low level indicator turned on		
3	27	0x08 - hydraulic system high temperature indicator turned on		
3	28	0x10 - oil overflow in hydraulic chamber indicator turned on		
3	29	0x20 - air filter is plugged indicator turned on		
3	30	0x40 - fuel filter is plugged indicator turned on		
3	31	0x80 - water in fuel indicator turned on		
4	32	0x01 - Clogged brake system filter indicator turned on		
4	33	0x02 -low washer fluid level indicator turned on		
4	34	0x04 - low AdBlue level indicator turned on		
4	35	0x08 - low trailer tyre pressure indicator turned on		
4	36	0x10 - wear of trailer brake lining indicator turned on		
4	37	0x20 - high trailer brake temperature indicator turned on		
4	38	0x40 - incorrect trailer pneumatic supply indicator turned on		
4	39	0x80 - low CNG level indicator turned on		

## ALL-CAN300 Agricultural State Flags

Agricultural State Flags are only stored by [ALL-CAN300](#) :

Agricultural State Flags P2			Agricultural State Flags P4				
Byte	Bit	Value bitmasks	ALLCAN	Byte	Bit	Value bitmasks	ALLCAN
0	0	0x01 - Mowing	☐	0	0	0x01 - right joystick moved right active	☐
0	1	0x02 - Grain release from hopper	☐	0	1	0x02 - right joystick moved left active	☐
0	2	0x04 - First front hydraulic turned on	☐	0	2	0x04 - right joystick moved forward active	☐
0	3	0x08 - Rear Power Take-Off turned on	☐	0	3	0x08 - right joystick moved back active	☐
1	8	0x01 - Excessive play under the threshing drum	☐	0	4	0x10 - left joystick moved right active	☐
1	9	0x02 - Grain tank is open	☐	0	5	0x20 - left joystick moved left active	☐
1	10	0x04 - 100% of Grain tank	☐	0	6	0x40 - left joystick moved forward active	☐
1	11	0x08 - 70% of Grain tank	☐	0	7	0x80 - left joystick moved back active	☐
1	12	0x10 - Drain filter in hydraulic system of drive cylinders is plugged	☐	1	8	0x01 - first rear hydraulic turned on	☐
1	13	0x20 - Pressure filter of drive cylinders hydraulic system is plugged	☐	1	9	0x02 - second rear hydraulic turned on	☐
1	14	0x40 - Alarm oil level in oil tank	☐	1	10	0x04 - third rear hydraulic turned on	☐
1	15	0x80 - Pressure filter of brakes hydraulic system is plugged	☐	1	11	0x08 - fourth rear hydraulic turned on	☐
2	16	0x01 - Oil filter of engine is plugged	☐	1	12	0x10 - first front hydraulic turned on	☐
2	17	0x02 - Fuel filter is plugged	☐	1	13	0x20 - second front hydraulic turned on	☐
2	18	0x04 - Air filter is plugged	☐	1	14	0x40 - third front hydraulic turned on	☐
2	19	0x08 - Alarm oil temperature in hydraulic system of chasis	☐	1	15	0x80 - fourth front hydraulic turned on	☐
2	20	0x10 - Alarm oil temperature in hydraulic system of drive cylinders	☐	2	16	0x01 - front three-point hitch turned on	☐
2	21	0x20 - Alarm oil pressure in engine	☐	2	17	0x02 - rear three-point hitch turned on	☐
2	22	0x40 - Alarm coolant level	☐	2	18	0x04 - front power take-off turned on	☐
2	23	0x80 - Overflow chamber of hydraulic unit	☐	2	19	0x08 - rear power take-off turned on	☐
3	24	0x01 - Unloader drive is ON. Unloading tube pivot is in idle position	☐	2	20	0x10 - mowing active	☐
3	25	0x02 - No operator!	☐	2	21	0x20 - threshing active	☐
3	26	0x04 - Straw walker is plugged	☐	2	22	0x40 - grain release from hopper turned on	☐
3	27	0x08 - Water in fuel	☐	2	23	0x80 - grain tank is 100%	☐
3	28	0x10 - Cleaning fan RPM	☐	3	24	0x01 - grain tank is 70%	☐
3	29	0x20 - Threshing drum RPM	☐	3	25	0x02 - grain tank is opened	☐
4	33	0x02 - Low water level in the tank	☐	3	26	0x04 - unloader drive is on; unloading tube pivot is in idle position	☐
4	34	0x04 - First rear hydraulic turned on	☐	3	27	0x08 - cleaning fan control turned off	☐
4	35	0x08 - Standalone engine working	☐	3	28	0x10 - threshing drum control turned off	☐
4	36	0x10 - Right joystick moved right	☐	3	29	0x20 - straw walker is clogged	☐
4	37	0x20 - Right joystick moved left	☐	3	30	0x40 - excessive clearance under the threshing drum	☐
4	38	0x40 - Right joystick moved front	☐	3	31	0x80 - low temperature of drive system hydraulics <5 grades	☐
4	39	0x80 - Right joystick moved back	☐	4	32	0x01 - high temperature of drive system hydraulics >86 grades	☐
5	40	0x01 - Brushes turned on	☐	4	33	0x02 - ear auger speed below the norm	☐
5	41	0x02 - Water supply turned on	☐	4	34	0x04 - grain auger speed below the norm	☐
5	42	0x04 - Vacuum cleaner	☐	4	35	0x08 - straw chopper speed below the norm	☐
5	43	0x08 - Unloading from the hopper	☐	4	36	0x10 - straw shaker speed below the norm	☐
5	44	0x10 - High Pressure washer (Karcher)	☐	4	37	0x20 - feeder speed below the norm	☐
5	45	0x20 - Salt (sand) disperser ON	☐	4	38	0x40 - straw chopper switched on	☐
5	46	0x40 - Low salt (sand) level	☐	4	39	0x80 - corn header connected	☐
6	48	0x01 - Second front hydraulic turned on	☐	5	40	0x01 - grain header connected	☐
6	49	0x02 - Third front hydraulic turned on	☐	5	41	0x02 - feeder reverse switched on	☐
6	50	0x04 - Fourth front hydraulic turned on	☐	5	42	0x04 - the pressure filter of the hydraulic pump is clogged	☐
6	51	0x08 - Second rear hydraulic turned on	☐				
6	52	0x10 - Third rear hydraulic turned on	☐				
6	53	0x20 - Fourth rear hydraulic turned on	☐				
6	54	0x40 - Front three-point Hitch turned on	☐				
6	55	0x80 - Rear three-point Hitch turned on	☐				
7	56	0x01 - Left joystick moved right	☐				
7	57	0x02 - Left joystick moved left	☐				
7	58	0x04 - Left joystick moved front	☐				
7	59	0x08 - Left joystick moved back	☐				
7	60	0x10 - Front Power Take-Off turned on	☐				

## ALL-CAN300 Utility & Cistern State Flags

Utility and Cistern State Flags are only stored by [ALL-CAN300](#).

Utility State Flags P4			
Byte	Bit	Value bitmasks	ALLCAN
0	0	0x01 - salt (sand) disperser is on	<input type="checkbox"/>
0	1	0x02 - pouring chemicals turned on	<input type="checkbox"/>
0	2	0x04 - conveyor belt is turned on	<input type="checkbox"/>
0	3	0x08 - salt spreader's drive wheel turned on	<input type="checkbox"/>
0	4	0x10 - brushes turned on	<input type="checkbox"/>
0	5	0x20 - vacuum cleaner turned on	<input type="checkbox"/>
0	6	0x40 - water supply turned on	<input type="checkbox"/>
0	7	0x80 - high pressure washer (Karcher) turned on	<input type="checkbox"/>
1	8	0x01 - liquid pump turned on	<input type="checkbox"/>
1	9	0x02 - unloading from the hopper turned on	<input type="checkbox"/>
1	10	0x04 - low salt (sand) level in container indicator turned on	<input type="checkbox"/>
1	11	0x08 - low water level in container indicator turned on	<input type="checkbox"/>
1	12	0x10 - chemicals turned on	<input type="checkbox"/>
1	13	0x20 - compressor turned on	<input type="checkbox"/>
1	14	0x40 - water valve is opened	<input type="checkbox"/>
1	15	0x80 - cabin moved up status active	<input type="checkbox"/>
2	16	0x01 - cabin moved down status active	<input type="checkbox"/>

Cistern State Flags P4			
Byte	Bit	Value bitmasks	ALLCAN
0	0	0x01 - section 1 - presence of fluid in the downpipe	<input type="checkbox"/>
0	1	0x02 - section 1 - filled	<input type="checkbox"/>
0	2	0x04 - section 1 - overfilled	<input type="checkbox"/>
0	3	0x08 - section 2 - presence of fluid in the downpipe	<input type="checkbox"/>
0	4	0x10 - section 2 - filled	<input type="checkbox"/>
0	5	0x20 - section 2 - overfilled	<input type="checkbox"/>
0	6	0x40 - section 3 - presence of fluid in the downpipe	<input type="checkbox"/>
0	7	0x80 - section 3 - filled	<input type="checkbox"/>
1	8	0x01 - section 3 - overfilled	<input type="checkbox"/>
1	9	0x02 - section 4 - presence of fluid in the downpipe	<input type="checkbox"/>
1	10	0x04 - section 4 - filled	<input type="checkbox"/>
1	11	0x08 - section 4 - overfilled	<input type="checkbox"/>
1	12	0x10 - section 5 - presence of fluid in the downpipe	<input type="checkbox"/>
1	13	0x20 - section 5 - filled	<input type="checkbox"/>
1	14	0x40 - section 5 - overfilled	<input type="checkbox"/>
1	15	0x80 - section 6 - presence of fluid in the downpipe	<input type="checkbox"/>
2	16	0x01 - section 6 - filled	<input type="checkbox"/>
2	17	0x02 - section 6 - overfilled	<input type="checkbox"/>
2	18	0x04 - section 7 - presence of fluid in the downpipe	<input type="checkbox"/>
2	19	0x08 - section 7 - filled	<input type="checkbox"/>
2	20	0x10 - section 7 - overfilled	<input type="checkbox"/>
2	21	0x20 - section 8 - presence of fluid in the downpipe	<input type="checkbox"/>
2	22	0x40 - section 8 - filled	<input type="checkbox"/>
2	23	0x80 - section 8 - overfilled	<input type="checkbox"/>

## LV-CAN200/ALL-CAN300 Important Information

### Program Number logic change

Due to the growing number of supported cars, program numbers have exceeded "999". In order to maintain one number format, we are moving from 3-digit to 4-digit program numbers.

In new [LV-CAN200/ALL-CAN300](#) firmware (from 2017-09-01) all program numbers that were up to 999 are changed to start from 1000. So that further program numbers would continue the counting with 4-digit numbers.

However, all existing program numbers stay the same, but "1" is added to the front. The device still understands the entered 3-digit program number (via SMS/GPRS), it will automatically add "1" before it. If you enter "247" - device number will turn into "1247". In Bootloader only a 4-digit format is available, just add "1" to the front of the needed program number.

## **Program Number logic change from 2018-01-01**

From 2018-01-01 additional digit was added to the program number. Currently, the program number consists of 5 digits. This logic applies to all CAN adapters manufactured after 2018-01-01.

### **Example**

When using older connection schemes where program number displayed as a 3-digit program number:



Using [LV-CAN200/ALL-CAN300](#) Bootloader from soft version 2017-09-27 it is necessary to add "1" to the front of the program number:

