# FMM650 CAN adapters

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FMM650 supports CAN adapters over RS232 connection. **CAN adapter support is added from 02.02.11.Rev.00 firmware** 

Easy steps to install and configure following CAN adapters on FMM650 device:

- LV-CAN200
- <u>ECAN02</u>

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## Installing CAN adapter with FMM650 device

### **Installing LV-CAN200**

You can watch <u>LV-CAN200</u> installation video in our YouTube channel <u>here</u> or follow connection instructions below.

### Tools needed for installation

- LV-CAN200
- Connection scheme (Please contact Teltonika Sales Representative and provide information about **vehicle manufacturer**, **model** and **year**.
- FMM650 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 (maybe different) according to the connection scheme.
- 3. Connect CAN adapter with FMM650:
  - 1. Connect CAN adapter's RS232 to RJ45 of FMM650.
- 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 the vehicle.
- 5. Connect CAN adapter **positive** and **ground** wires to the vehicle power supply lines or near FMM650 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

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

### Installing LV-CAN200 + ECAN02

### Tools needed for installation

- LV-CAN200
- Connection scheme (Please contact Teltonika Sales Representative and provide information about **vehicle manufacturer**, **model** and **year**.
- <u>ECAN02</u> (Used for contactless connection. If **two CAN lines** need to be connected, **ECAN02** must be used.)
- FMM650 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 <u>LV-CAN200 installation</u>.
- 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 the vehicle.
- 3. Fasten <u>ECAN02</u> on 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 <u>ECAN02</u> PCB.
- 4. Connect CAN adapter **positive** and **ground** wires to the vehicle power supply lines or near FMM650 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** <u>CAN Adapter</u> configuration

### **CAN Adapter Configuration**

### **CAN Adapter program number selection**

CAN Adapter must be set to the 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 the program number in the adapter **Software date of the CAN adapter must be newer than the connection scheme date**. CAN adapter Software date can be checked:

- Via <u>Teltonika Configurator→Status→CAN Adapter</u>
- Via SMS command lvcangetinfo

The number of digits required to enter the correct Program No. may vary depending on the Software

and manufacture date of your CAN Adapter:

• LV-CAN200 adapter changes

### **Entering via SMS command**

#### Required conditions:

• CAN adapter properly connected to FMM650 device

CAN adapter program number can be set remotely, using an SMS command. Send following **SMS command** to FMM650 device:

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

Command example: lvcansetprog 11434 SMS response: LVCAN ProgNum: 11434

If during SMS command FMM650 was in the following Sleep mode:

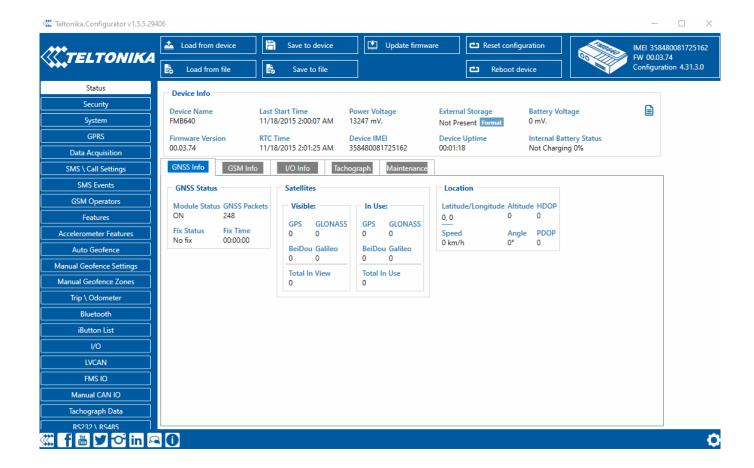
- GPS Sleep Program No. will be set immediately.
- Deep Sleep Program No. will be set after the device wakes up.
- Online Deep Sleep Program No. will be set immediately.

### **Entering via Teltonika Configurator**

### Required conditions:

CAN adapter properly connected to FMM650 device

CAN adapter program number can be set via <u>Teltonika Configurator</u>  $\rightarrow$  LVCAN  $\rightarrow$  Program Number. When the program number is entered press  $\boxtimes$  Save to device button that saves the entered program number into FMM650.



### **Entering manually**

### Required conditions:

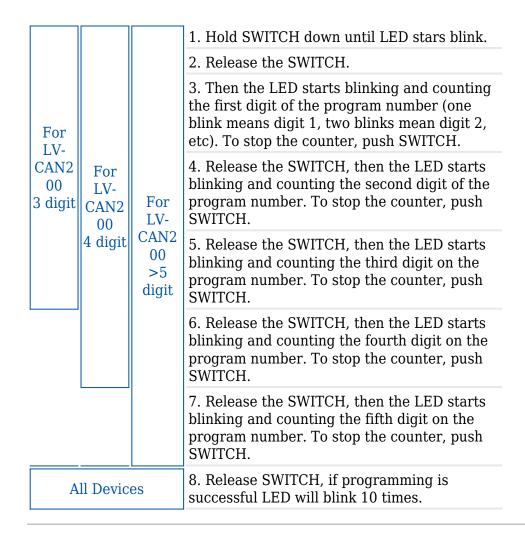
- CAN adapter properly connected to FMM650 device
- Vehicle ignition must be ON

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

Steps to set program number:

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LV-CAN200 back



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

Depending on CAN Adapter I/O parameters and ignition status, FMM650 can send locked (last known) CAN Adapter I/O and active (real-time) parameter values or reset values to 0. When the ignition is off, CAN Adapter I/O parameters values sent to the server are:

CAN Adapter I/O element	Status
Vehicle Speed	reset
Accelerator pedal position	reset
Total fuel used	lock
Fuel level (liters)	lock
Engine RPM	reset
Total mileage	lock
Fuel level (%)	lock
Program number	lock
Module ID	lock
<b>Engine Work Time</b>	lock

Engine Work Time loc (counted)	k
Total Mileage (counted) loc	k
Fuel Consumed (counted) loc	k
Fuel Rate res	et
Program number loc	k
AdBlue Level (%) loc	k
AdBlue Level (liters) loc	k
Engine Load res	et
Engine Temperature act	ive
Axle 1 Load loc	k
Axle 2 Load loc	k
Axle 3 Load loc	k
Axle 4 Load loc	k
Axle 5 Load loc	k
Control State Flags act	ive
Agricultural Machinery act Flags	ive
Harvesting Time loc	k
Area of Harvest res	et
Mowing Efficiency act	ive
Grain Mown Volume act	ive
Grain Moisture act	ive
Harvesting Drum RPM res	et
Gap Under Harvesting act Drum	ive
Security State Flags act	ive
Tachograph Total Vehicle loc Distance	k
Trip Distance res	et
Tachograph Vehicle Speed res	et
<b>Tachograph Driver Card</b> act <b>Presence</b>	ive
Driver1 States act	ive
Driver2 States act	ive
<b>Driver1 Continuous Driving</b> act	ive
<b>Driver2 Continuous Driving</b> act	ivo
Time	.1 v G

Driver2 Cumulative Break Time	active
Driver1 Selected Activity Duration	active
Driver2 Selected Activity Duration	active
<b>Driver1 Cumulative Driving Time</b>	active
<b>Driver2 Cumulative Driving Time</b>	active

### **SMS Configuration**

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 <u>lvcangetinfo</u> example:

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

GPRS commands require <a>Codec 12</a> protocol.

For more SMS commands please see SMS/GPRS command list

COMMAND	DESCRIPTION	RESPONSE
lvcansetprog #	Set program number to CAN Adapter that is connected to FMM650. # - three digit number that identity vehicle.	Yes
lvcansimpletacho #	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 FMM650.	Yes
lvcangetinfo	Get information about connected CAN Adapter	Yes

lvcanclear #	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
lvcanfaultcodes	Read DTC fault codes	Yes