

# Automatic engine detection

## Introduction

In some cases users might experience problems with an engine state detection. If custom voltage ranges for engine detection are not suitable and they need a plug and play solution, they can rely on an automatic engine state detection functionality.

Feature is available for the for FM-Plug4 device:

- FM-Plug4/4+

This feature description applies to FM device with the latest firmware version in it. You can get the newest firmware and configurator from our documentation website: [doc.ruptela.lt](http://doc.ruptela.lt)

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## Document change log

Date	Version	Change details
2016-05-30	1.0	Initial draft.
2017-04-07	1.1	Added option to disable OBD Pin1 automatic check.

## Feature description

Automatic engine state detection feature employs the following two methods:

- Capturing power supply voltage when the engine is on and when it is off.
- Checking OBD pin1 state.

## Capturing power supply voltage

In this case the FM-Plug4 device will automatically capture power supply voltage levels when the engine is on and when it is off. The user is required to send a specific SMS command to the device. This command triggers power supply capturing process.

### Preparation

Before the start make sure that the FM-Plug4 device is plugged into the vehicle's OBD socket. We also recommend to take a short trip lasting 10 - 15 minutes. This should ensure that battery voltage is within normal operation levels. This might not be the case when the vehicle's internal power generator is charging the battery.

### Capturing process

Once the preparations are complete, park your vehicle in a safe location. It should be standing still with its engine ON.

Send an "enginevolt" SMS command to the FM-Plug4 device. Command structure:

*password enginevolt*

- <password> - Text string, password for the authentication. The maximum size of the parameter is 50 bytes.
- <enginevolt> - Command that triggers an automatic engine detection.

If message structure is wrong, FM-device will answer: "Unknown command".

"Enginevolt" command triggers power supply measurements. Device captures power supply voltage and considers it as an engine ON threshold. After capturing upper voltage level device will reply with "Turn off engine" SMS message.

After sending the reply message, device waits 60 seconds and then measures power supply voltage again. This time it add 200 millivolts to the measured value and considers it to be an engine OFF threshold. When both voltage ranges are successfully measured, device writes engine ON and engine OFF threshold values to all 4 device configuration profiles and selects engine source – *Power voltage*. After this configuration update, device will send the following SMS notification: "Engine detection done".

### Errors that might occur

If upper voltage level was below 13000 mV or difference between two captured values is smaller than 200 mV, device will not accept these voltages and send the following SMS message: "Engine detection error".

## Summarized action sequence

- Once the preparations are complete, park your vehicle in a safe location. It should be standing still with its engine ON.
- Send an "enginevolt" SMS command to the FM-Plug4 device:  
*password enginevolt*
- Wait for the answer from the device. It should replay with the following message: "Turn off engine".
- Turn OFF your vehicle's engine and wait.
- After a successful configuration the device should send a SMS message: "Engine detection done".
- Process is complete.

## Checking OBD Pin1 state

Checking OBD Pin1 state works independently from the power supply capture feature described above. When engine detection by power voltage is configured, OBD Pin1 state check is automatic and works all the time.



## Description

Every time when the device starts (it powers up, after firmware update, etc.) device begins monitoring OBD pin1 state [high - 1/low - 0]. By default OBD pin 1 state does not represent engine condition. However, if OBD pin 1 state changes from 0 to 1 and back to 0 or from 1 to 0 and back to 1, then device will consider it as an engine state and will not check other conditions. This apply for all 4 device configuration profiles.

Device will monitor and wait for a change in OBD pin1 state for as long as it on.

After each restart (powers up, after firmware update, etc.) configuration is reset to the default state and a new OBD pin 1 monitoring cycle begins.

## Disable OBD Pin1 automatic check

If you want to disable this feature, perform actions listed below:

1. Launch FM4 configurator and choose Plug4 device
2. In the profile settings, Data collection section untick the **Use OBD Pin1** check box.

