Ruptela
Transport Telematics

Device configuration via SMS
Quick Start Guide

2019/02

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1 Preface

1.1 Introduction

SMS configuration solution enables users to change any configuration parameter via SMS command. User is required to know an ID for the specific parameter and then provide a value for it. Users are now available to change device configuration in remote locations where GPRS is unavailable. This is also very useful for users who prefer to send configuration to their devices via SMS. This manual includes the description of existing SMS commands for manual use and the DIFF to SMS configuration tool description, which automatizes the SMS command generation.

1.2 Compatibility

This features description is applicable for these FM devices with the latest firmware version:

- FM-Tco4 HCV
- FM-Tco4 LCV
- FM-Pro4
- FM-Eco4
- FM-Eco4 S
- FM-Plug4

You can get the latest firmware and configurator from our documentation website: doc.ruptela.lt

1.3 Legal information

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1.4 Document change log

Date	Version	Change details
2015-11-24	1.0	Initial draft.
2016-10-27	1.1	Updated Custom ignition configuration description.
2016-11-22	1.2	Added "Ignore empty space before the SMS command" feature description in the "SMS command structure" chapter.
2017-03-10	1.3	Various minor logic changes and corrections.
2017-12-06	1.4	Manual rework, merged DIFF to SMS config tool manual.
2019-02-26	1.5	Added device compatibility list as a new section in "Preface".

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2   General information

It is highly recommended to use this tool for most configurations. Because of the introduction of this tool, this manual has been shortened, and all no longer essential and overly complicated information was removed.

SMS configuration functionality mainly relays on two SMS messages:
- **setcfg** command allows to change all parameters, however there are few exceptions.
- **setioparam** command is used only for setup IO parameters.

Additionally, there are two SMS commands that can be used to receive the current device configuration:
- **getcfg** command is only used to get the current status of the selected parameter.
- **getioparam** command is only used to get the current status of the selected IO parameter.

Note
One SMS message can be 160 symbols long, so the maximum number of simultaneously transmitted or received parameters in one SMS message is limited.

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3 DIFF to SMS configuration tool

CFG DIFF to SMS is a standalone software tool integrated into the FM configurator, which is designed to ease the currently complicated manual configuration over SMS. This tool allows using a DIFF configuration file to generate a SMS message of all configured parameters within the selected file, thus shortening the time and effort needed to manually generate a SMS message.

Note

To configure a FM4 device via SMS, it is first required to enable configuration via SMS, which is described in the "Enabling SMS configuration" chapter of this document.

It is recommended to read through this document fully at least once, since it explains how SMS configuration works in detail, limitations, how specific parameters are configured, possible responses from the FM device and other commands, which have to be kept in mind when using the automated tool.

Limitations

It is important to note that not all parameters can be changed via SMS. The list of non editable via SMS parameters are diplasyed below:

- Timetable;
- Configuration password;
- SMS password;
- Enable/Disable SMS configuration;
- Geozone points.

These parameters can be changed only by connecting a FM4 device to a configurator directly via computer.

Other note worthy special cases mostly concern the "CAN interface" configuration. All configurations for CAN interfaces are connected between each other. CAN1 and CAN2 cannot be configured separately, this includes all the sub group configurations such as LCV group selection, Baud rate, etc. (For example: Previously the FM device was configured to CAN1 MobilEye, now the users decided to add an extra parameter and set CAN2 to LCV. If the user configures only the CAN2 parameter (CAN1 not enabled), saves the DIFF file and uses it to generate a SMS message, that message will overwrite the CAN1 parameter also, thus disabling CAN1. To properly configure CAN interfaces, full configuration must be entered for the CAN interfaces in the configurator prior to saving it to a DIFF file. This happens, because the SMS message configures CAN1 and CAN2 with a single number in decimal format, which means that both interfaces are configured at the same time.

Other exceptional cases:

- Send data without GPS fix;
- Custom ignition;
- GSM jamming configuration;

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Configuration

Before generating a SMS, a configuration file must be created. To do this, the user must select and configure the parameters he wishes to enable. Configuration description of each parameter for every device can be found at doc.ruptela.lt. When creating a configuration file it is important to keep in mind the limitations and exceptional cases mentioned earlier.

Attention

A DIFF file will save all made changes to a configuration. For example changing a number in the IP filed, or marking a checkbox, but, if a change was made, and afterwards reverted to the previous state (checkbox checked, and unchecked afterwards), this will not be marked as a "change made". DIFF will only record changes made to the initial configuration (a loaded pre-set configuration is considered an initial configuration). Particular attention must be taken, when creating a DIFF file, to avoid accidental changes to the configuration.

When creating a configuration file it is not required to create a full configuration, only parameters that the user wants to change or enable should be modified. If the user wants to disable some of the previous parameters, it is best to load the previous configuration file and make changes to it, because otherwise the software will not see the changes. After creating the desired configuration, the user can go straight to the SMS generation, or save the DIFF file.
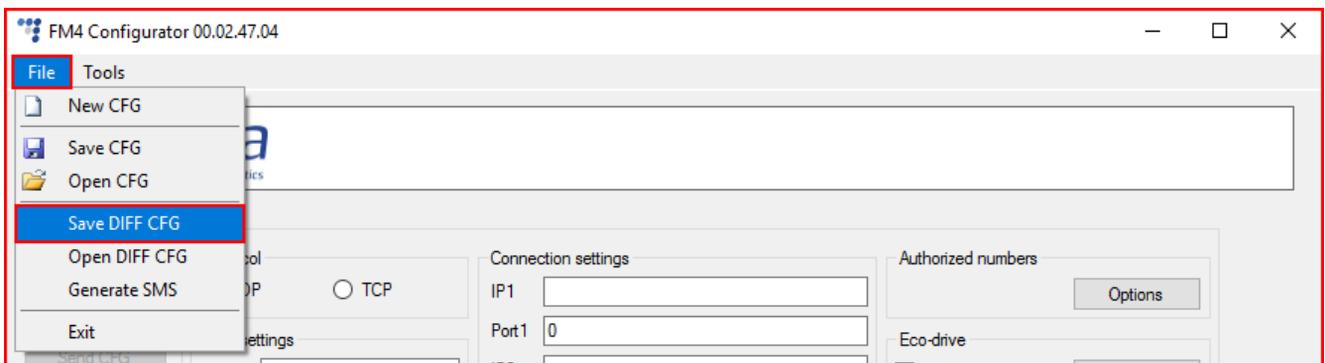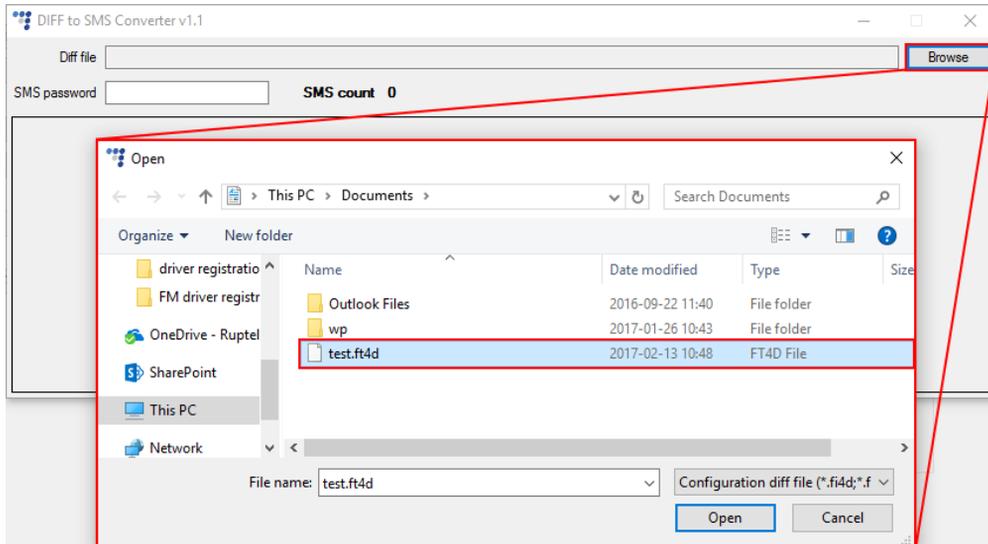

Generate SMS

After making all the necessary changes to the configuration, the user must open the "DIFF to SMS converter" tool by clicking **File>Generate SMS.**
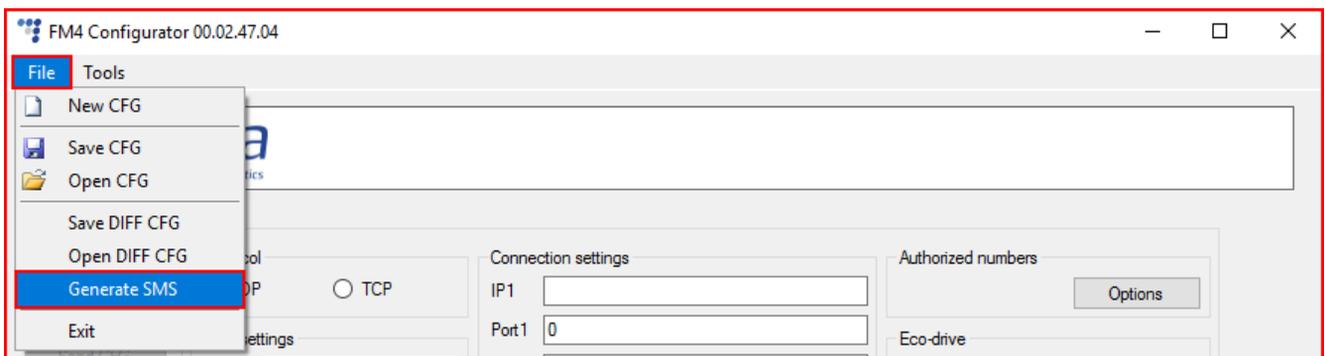
This will open the "DIFF to SMS converter" tool. The tool will automatically load the currently open configuration (even if it is not saved). If the user wants to load a different DIFF file, he must select the previously saved DIFF file by clicking **browse** and navigating to the saved DIFF file.

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After selecting the DIFF file (or opening the tool after creating a configuration without saving):

1. Name and location of the DIFF file will be displayed in the field above;
2. If the password was entered during the first configuration, it must be entered in this field now, otherwise the commands in the SMS message will not be accepted;
3. SMS count displays the amount of messages in which all the commands are separated. This is used because the device can acknowledge only **one message at a time** with a maximum character length of **160 symbols**;
4. The highlighted text represents the SMS message that needs to be sent to the FM device to configure the parameters saved in the DIFF file. The number to left of the highlighted text represents the number of the SMS message.

If any of the five unchangeable via SMS parameters described in the "Limitations" section was included in the DIFF file, a warning window will appear after selecting the DIFF file.
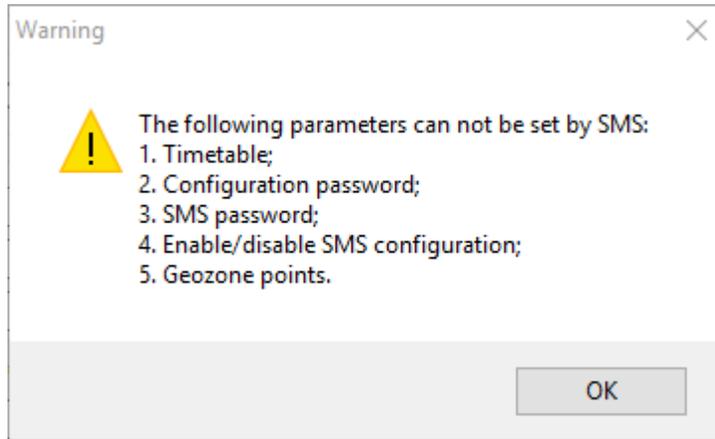
Possible response from the FM device after receiving the SMS command, are described in the next chapters, after each SMS commands description.

4   Enabling SMS configuration

SMS configuration feature is enabled/disabled in configuration tool.

1. In **Authorized numbers** section click on "Options" button.
2. In the "Numbers" popup window put a tick in the **Enable SMS configuration** check box.
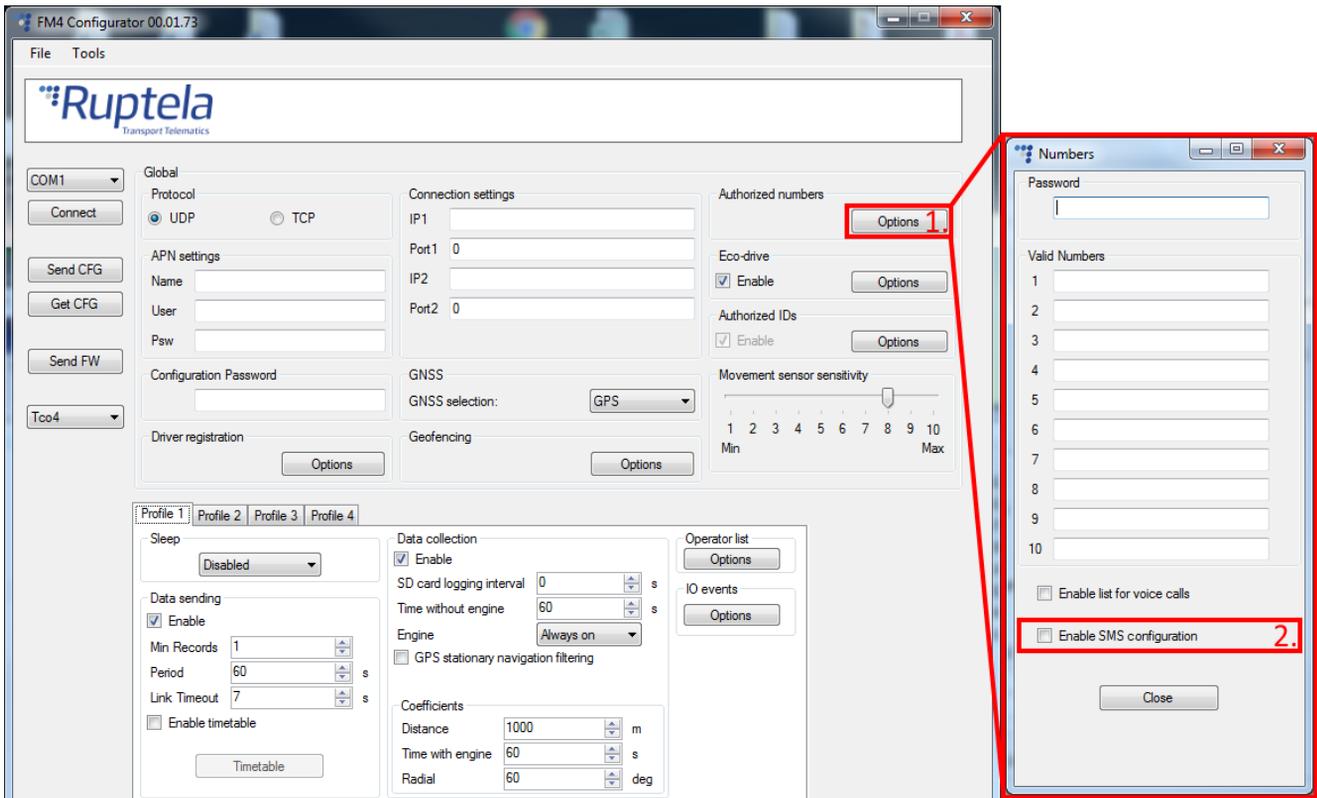
> ## Note
> SMS configuration feature has to be manually enabled or disabled. This is done in the configuration tool. This is one of the configuration parameters that cannot be changed via SMS command.

4.1   SMS command structure

SMS structure: "(password) (command) (command text)"
- Password, command and command text are separated by space " " symbol.
- Password – if there is no password, then you can type in just the space symbol " " before the command.

> ## Note
> SMS commands handling mechanism was updated. Currently, if there is no password set for the SMS commands, the device will ignore empty space(s) before the command. This means that the device accepts SMS commands with or without empty space(s) before the command. Feature applies starting from these firmware versions:
> FM-Plug4/4+   - 00.01.07.01
> FM-Eco4/4+ and FM-Eco4 light/light+   - 00.01.21.08

- Usually command text parameters are separated by comma "," symbol.

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5 SMS command "setcfg"

Setcfg command allows to change all parameters, except Timetable, Passwords (configuration and SMS), "Enable SMS configuration" and geozone points. SMS can be written in lowercase and uppercase letters, because SMS commands are not case sensitive. Only parameters provided with SMS will be changed, others will remain the same.

Structure of the "setcfg" message

It is mandatory to enter a correct password "Password" followed by a single space " " symbol. Then command "setcfg" is entered, which is again followed by a single space " " symbol. After that enter parameter ID number "ID" followed by a single space " " symbol and parameter value "Value1". If you need to set few different parameters, then after the first parameter value enter a comma symbol and add a single space symbol ", ". Enter parameter ID number "ID2" followed by a single space " " symbol and parameter value "Value2". Continue for as many parameters as necessary. Final SMS message should have a similar structure to the one provided below:

Password **setcfg** *ParamID1 Value1, ParamID2 Value2, ParamID3 Value3, …*

Examples

Usually parameter configuration is very straight forward as described above. Below you will find few simple examples that illustrate this case:

- Set GPRS transport protocol to "TCP":

  Password **setcfg** 100 0

- Set IP1 to "www.kompanija.com" and IP1 Port number to "6002":

  Password **setcfg** 110 www.kompanija.com, 120 6002

- Set IP2 to "123.000.111.222" and IP2 Port number to "13242":

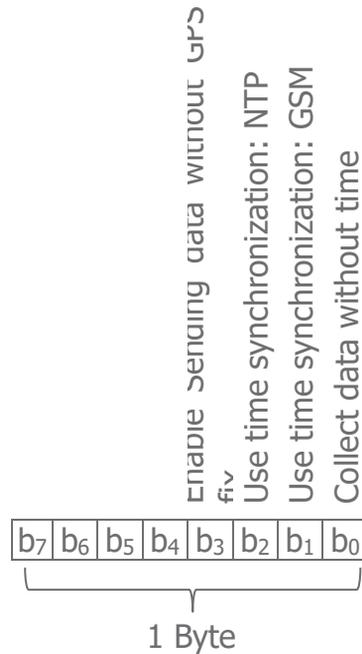 Password **setcfg** 111 123.000.111.222, 121 13242

5.1 Exceptional cases

5.1.1 Send data without GPS fix

Parameters for Sending data without GPS fix are enabled/disabled via value stored in a special register (size 1 Byte). Each bit within this 1 Byte has a parameter assigned to it (see table below). Parameter is enabled, when the corresponding bit in the register is set to 1. If bit value is 0, then the corresponding parameter is disabled. Values for all bits have to be set with one SMS message. To do this you will have to determine a correct decimal number and use it as a value, when using Sending data without GPS feature (ID = 147).

First you have to decide what parameters you are going to use. This determines the bit pattern within the register. Set corresponding bits to 1, all unused parameters are set to 0. Now read bit values from this register starting from the left. You will have a number in binary

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format. Translate it to the number in Decimal format. This is a number that needs to be included in the SMS message to configure the Sending data without GPS fix.

| b_7 | b_6 | b_5 | b_4 | b_3 | b_2 | b_1 | b_0 |

1 Byte

Column labels (from b_3 to b_0): Enable Sending data without GPS fix · Use time synchronization: NTP · Use time synchronization: GSM · Collect data without time

Examples

● Enable Sending data without GPS fix. Configuration with "Collect data without time" enabled and "Use time synchronization: NTP".

| 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |

Column labels (from b_3 to b_0): Enable Sending data without GPS fix · Use time synchronization: NTP · Use time synchronization: GSM · Collect data without time
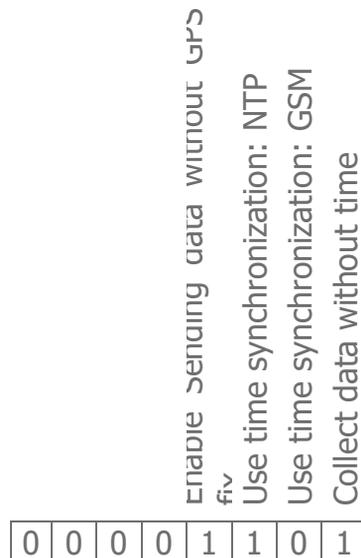
Reading register values from the left we obtain: 00001101
Number in binary format: 1101_{BIN}
Number in decimal format: 13_{DEC}

SMS message for Sending data without GPS fix enabled, configuration with "Collect data without time" enabled and "Use time synchronization: NTP":

Password **setcfg** 147 13

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- Sending data without GPS fix enabled, configuration with "Collect data without time" enabled.

  Reading register values from the left we obtain: 00001001
  Number in binary format: 1001_{BIN}
  Number in decimal format: 9_{DEC}

  SMS message for Sending data without GPS fix enabled, configuration with "Collect data without time" enabled:

  Password **setcfg** 147 9

5.2 Response to "setcfg"

Once you have sent the SMS command there is a number of different possible answers from the device. These responses are sent to the same telephone number, which previously sent the SMS:

- When successfully setting parameters with FM device:

  "Configuration parameter(s) was set! "

- Incorrect parameter setting:

  "Configuration parameter(s) was NOT set! Parameter No. 1 is incorrect".

  Where parameter No is parameter ID

- Unsuccessful set-up, when parameters are locked:

  "Configuration parameter(s) was NOT set! Parameter No. 1 is locked"

  Where parameter No is parameter order in SMS message.

- If SMS configuration is disabled in configuration tool or configuration has password:

  "You do not have permission to change the settings".

6 SMS command "setioparam"

Setioparam command is used only for setup IO parameters configuration. It is most suitable, when user is not interested in modifying global configuration parameters (APN settings, Connection settings etc.). You are not required to enter all the mandatory parameter values

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that are associated with the **setcfg** command and this helps to reduce the overall length of the SMS message.

Full list of IO parameters and they ID numbers is available in "[FMIOData+size + description.xls](#)". You can find the most recent version of this document in our documentation website:

Address: https://doc.ruptela.lt/display/AB/FM4

Structure of the full "setioparam" message

It is mandatory to enter a correct password "Password" followed by a single space " " symbol. Then command "**setioparam**" is entered, which is again followed by a single space " " symbol. These are the only space symbols used in this command. After that enter parameter names and their values. There are 10 parameters: **id=**, **profile=**, **enable=**, **level=**, **delta=**, **average=**, **eventon=**, **include=**, **priority=**, **switch=**, **edge=**.

Parameters and their values are separated only with comma symbols. Parameter name with equality sign "**id=**" is followed by parameter value "*idNumber*". After the first parameter value enter a comma symbol ",". Enter another parameter name with equality sign "**profile=**" followed by parameter value "*profileNumber*". Continue this for all necessary parameters. Final SMS message should have a similar structure to the one provided below:

Password **setioparam**
id=*idNumber*,**profile=***profileNumber*,**enable=***enable*,**level=***level*,**delta=***delta*,
average=*average*,**eventon=***eventon*,**include=***include*,**priority=***priority*,**switch=***switch*,**edge=***edge*

Valid parameter values

Some parameters have a strict value rage. Only theses value can be included in the SMS message, otherwise error will occur. These parameters are: **enable**, **eventOn**, **include**, **priority** or **switch**

Valid numeric values for each parameter:

Enable	EventOn	Include	Priority	Switch	Edge
0 – disable	0 – Hysteresis	0 – not include data	0 – Low	0 – no switch	0 – On Both
1 – enable	1 – Change	1 – include data	1 – High	1 – 1st profile	1 – On rising
	2 – Monitoring			2 – 2nd profile	2 – On falling
				3 – 3rd profile	
				4 – 4th profile	

Example

Let's say that we want to monitor our device's power supply voltage. Monitoring should be configured on the 4th profile. SMS has to have the same structure as provided above. We begin the SMS by entering a configuration password "Password" and the command "setioparam".

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From the "FMIOData+size + description.xls" spread sheet we obtain FMIO parameter ID number for the "Power Supply Voltage". ID number is "29", so in the SMS message we type "id=29". Configuration should be done for the 4th profile "profile=4". For the configuration to work we must enable this parameter, so we enter "enable=1". Our chosen reference level is 12700 mV, we add "level=12700". Delta, which stands for variation is set to 1000 mV, we add "delta=1000". Averaging is set to 1000 ms, so we enter "average=1000". Event on is set to "Hysteresis", add "eventon=0". To enable "Include data only on event", we add "include=1". Priority is set to "Low" - "priority=0". Switch to is set to "No switch" – "switch=0". For Edge we choose "On Both" – "edge=0". Final result looks like this:

Password **setioparam id**=29,**profile**=4,**enable**=1,**level**=12700,**delta**=1000,**average**=1000,**eventon**=0,**include**=1, **priority**=0,**switch**=0,**edge**=0

Mandatory parameters for the "setioparam" message

SMS with **setioparam** command is valid when it contains at least these three parameters and their values:

- **Id** – parameter id number
- **profile** - profile number (can have value from 1 to 4).
- **enable** – can have value 1 or 0. If you enter 1 – some specific IO parameter will be enabled. If you enter 0 – some specific IO parameter will be disabled. When the FM-device receives the SMS where the parameter **enable** is set to 1, it performs a check in the current configuration to see if parameter with the same ID is already enabled.
  - •• If parameter with the same ID was not enabled, FM-device will set this IO parameter to the first free slot that is available.
  - •• If IO parameter with the same ID was enabled, FM-device will overwrite the IO parameter with new values.
  - •• If FM-device finds more than one IO parameters with the same ID it will send an error message.

Structure of the shortest possible message using "setioparam" command

Command includes only password, command "**setioparam**" and three mandatory parameters "**id**", "**profile**", "**enable**".

Password **setioparam id=**_id_**,profile=**_profile_**,enable=**_enable_

Example

Let's say that we want to monitor our device's battery voltage. Monitoring should be configured on the 4th profile. SMS has to have the same structure as provided above. We begin the SMS by entering a configuration password "Pasword123" and the command "setioparam". From the "FMIOData+size + description.xls" spread sheet we obtain a FMIO parameter ID number for the "Battery voltage". ID number is "30", so in the SMS message we type "id=30".

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Configuration should be done for the 4th profile "profile=4". For configuration to work we must enable this parameter, so we enter "enable=1". Result looks like this:

Password123 **setioparam id**=30,**profile**=4,**enable**=1

Reconfiguring an IO event

If SMS command does not define new values for **level**, **delta**, **average**, **eventOn**, **include**, **priority**, **switch** or **edge** parameters, then their values will not be changed – old values will remain.

Configuring new IO event

Let's say that you create a new IO event and specify values only for mandatory parameters (**id**, **profile**, **enable**). In such case values for the remaining parameters will be set to default. Default values are listed below:

Level	Delta	Average	Event On	Include	Priority	Switch	Edge
0	0	1000	2	0	0	0	0

6.1 Response to "setioparam"

Once you have sent the SMS command there is a number of different possible answers from the device. These responses are sent to the same telephone number, which previously sent the SMS:

- If IO parameter was set it correct, the FM-device would answer:

    „setioparam OK slot: XX"

    Where 'slot' is the slot where the FM-device set parameter.

- If all slots are full, FM-device would answer:

    „setioparam ERROR, no free slots for set the I/O"

- If FM-device finds more than one IO parameters with the same ID it would answer:

    "setioparam ERROR, more than one I/O with same ID"

- If user sent a SMS to disable (enable field = 0), and the parameter is not found as enabled, FM-device would answer:

    „setioparam ERROR, parameter is already disable"

- If IO parameter was not set it correct, FM-device would answer:

    „setioparam ERROR, <explanation>"

- If SMS configuration is disabled in configuration tool:

    „You do not have permission to change the settings"

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7   SMS command "getcfg"

This command is only used to get the current status of the selected parameter or parameters. Maximum data amount for selected parameters that can be simultaneously received in one SMS message is limited by the SMS message length (160 symbols).

Structure of the full "getcfg" message
It is mandatory to enter a correct configuration password "Password" followed by a single space " " symbol. Then command "getcfg" is entered, which is again followed by a single space " " symbol. After that enter parameter ID number "ID". If you need to get values for few different parameters, then after the first parameter ID enter a single comma symbol ",". Enter second parameter ID number "ID2". Continue for as many parameters as necessary. Final SMS message should have a similar structure to the one provided below:

Password **getcfg** *ParamID1,ParamID2,ParamID3, …*

Example
Get information whether ECO-dive beeper is enabled or disabled in the configuration. SMS message would look like this:

Password **getcfg** 410

7.1   Response to "getcfg"

Once you have sent the SMS command there is a number of different possible answers from the device. These responses are sent to the same telephone number, which previously sent the SMS:

● When parameter ID is correct, FM-device answer:

   „ID: XXX,value:XXX;"

   Example: 'ID: 96,value:1000;'

   Value can be string or number.

● Parameters configuration password and SMS password are not reachable with this SMS. In this case, the device answer:

   „ERROR: parameter(s) read is forbidden"

● If parameter ID is invalid, answer would be:

   „'ID:XXX,value:requested ID not found; "

   Example: 'ID:556,value:requested ID not found; '

● If SMS configuration is disabled in configuration tool or configuration has password:

„You do not have permission to change the settings"

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8 SMS command "getioparam"

This command is only used for get the current status of the selected IO parameter.

Structure of the full "getioparam" message

It is mandatory to enter a correct configuration password "Password" followed by a single space " " symbol. Then command "getioparam" is entered, which is again followed by a single space " " symbol. After that enter parameter ID number "ID". This is followed by a comma symbol and a single space symbol ", ". Enter a profile number "profileNumber". In one SMS data only for one parameter can be requested. Final SMS message should have a similar structure to the one provided below:

Password **getioparam** id, profileNumber

Example

Get information on Virtual Odometer configuration on the 2nd profile. SMS message would look like this:

Password **getioparam** 65,2

8.1 Response to "getioparam"

Once you have sent the SMS command there is a number of different possible answers from the device. These are sent to the same telephone number, which previously sent the SMS:

● If IO parameter was enabled, the FM-device would answer:

  Example:
  "id=28,profile=3,enable=1,level=0,delta=0,average=1000,eventon=2,include=0,priority=0, switch=0,edge=0"

● If IO parameter was not enabled, the FM-device would answer:

  „I/O ID XXX is NOT enabled "

  Example: 'I/O ID 100 is NOT enabled'.

● If IO parameter ID is invalid, the FM-device would answer:

  „ERROR I/O ID XXX does not exist"

  Example: ' ERROR I/O ID 1000 does not exist'

● If SMS configuration is disabled in configuration tool or configuration has password:

„You do not have permission to read the settings"