FM2 Quick Start Guide
V1.3

Contents

1. Physical connection

1.1 SIM card insert scheme

⚠ SIM card must have PIN code request disabled.
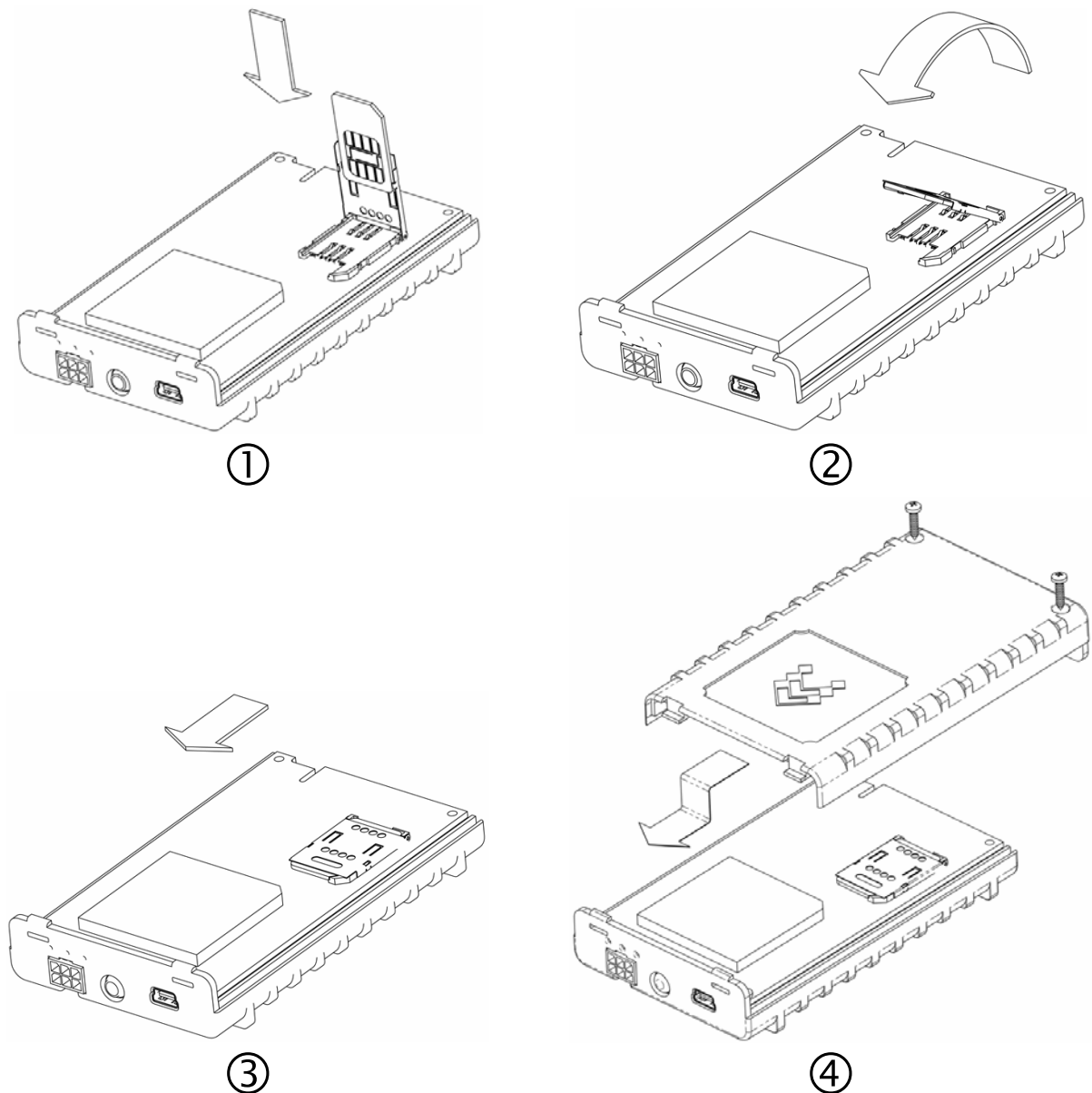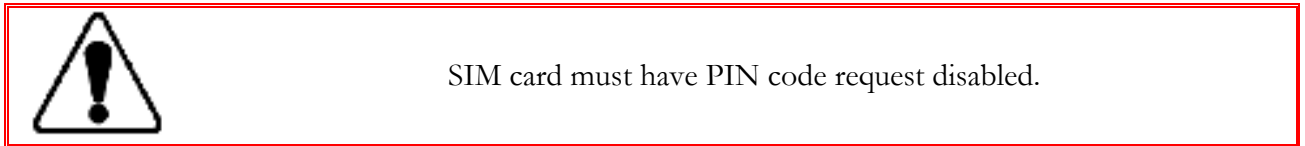
Figure 1. SIM card insert scheme

①	Open the SIM holder and insert the SIM card as shown.
②	Close the SIM holder
③	Push SIM holder's top part in shown direction to clip SIM holder
④	Assemble device with enclosure's top part as shown and screw the bolts.

1.2 Power supply connection

```
          DIN 1      3  ┌──────┐  6    OUT 2
          DIN 2      2  │ ▫  ▫ │  5    OUT 1
VCC (10÷30)V DC (+)   1  │ ▫  ▫ │  4    GND(VCC(10÷30)V DC)(-)
                         └──────┘
```
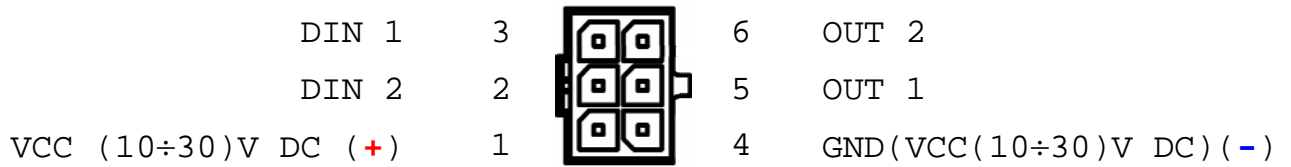Figure 2. 2×3 socket pinout

1.3 Antenna connection

FM2 is manufactured with internal or external GPS antenna. External antenna always has connector in front of the panel. When connected it should be placed so it can see

1.4 PC connection

Connect FM2 to PC using PORT1 cable.
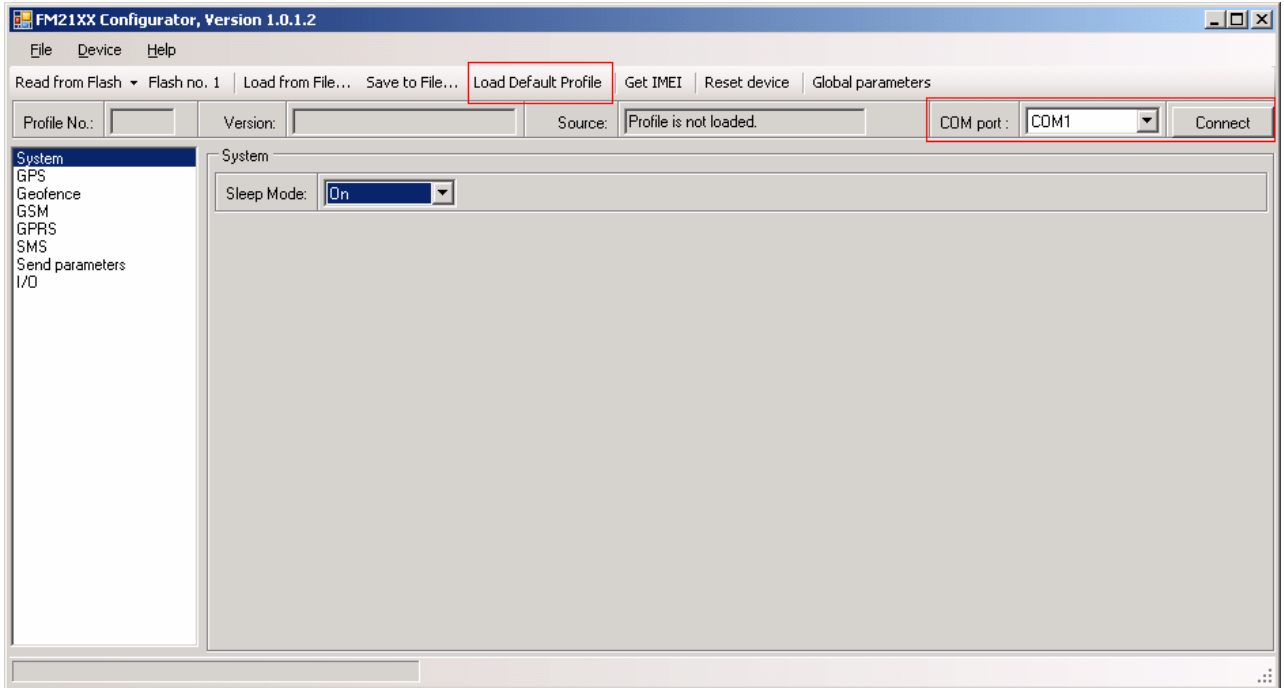
> ⚠ FM2100 does not have USB interface; it has Mini USB connector type with physical RS232 interface.
> Do not plug it to PC's USB port. Please use cables provided with FM2100 device.

2. Configuration

2.1 First steps

Launch FM2 configurator, choose COM port to which FM2 is connected and click 'Connect'. Click 'Load Default Profile' – this will load a template for all settings.

2.2 System Settings

'Sleep Mode' enables or disables sleep mode for FM2. If sleep mode is enabled, FM2 will check if there were no records for the last five minutes and if movement sensor status is 'not moving' and will switch FM2 to sleep mode. New SMS, input status change or movement sensor indication that movement is detected wakes up FM2.
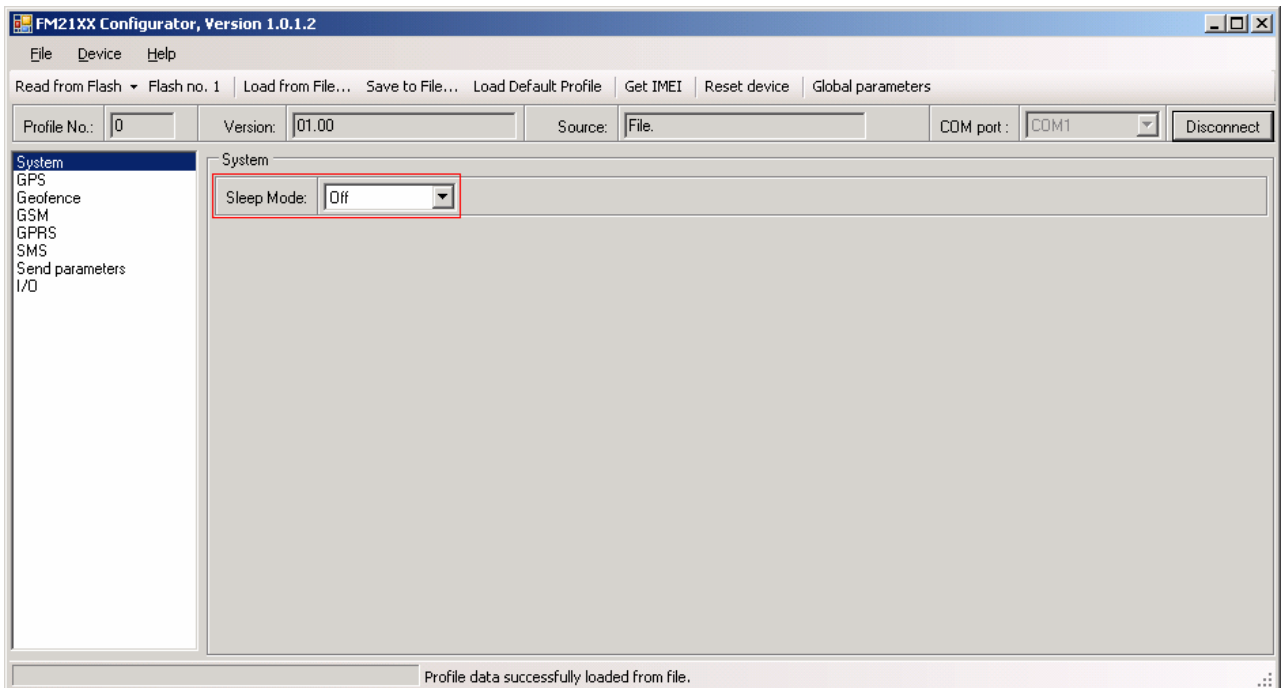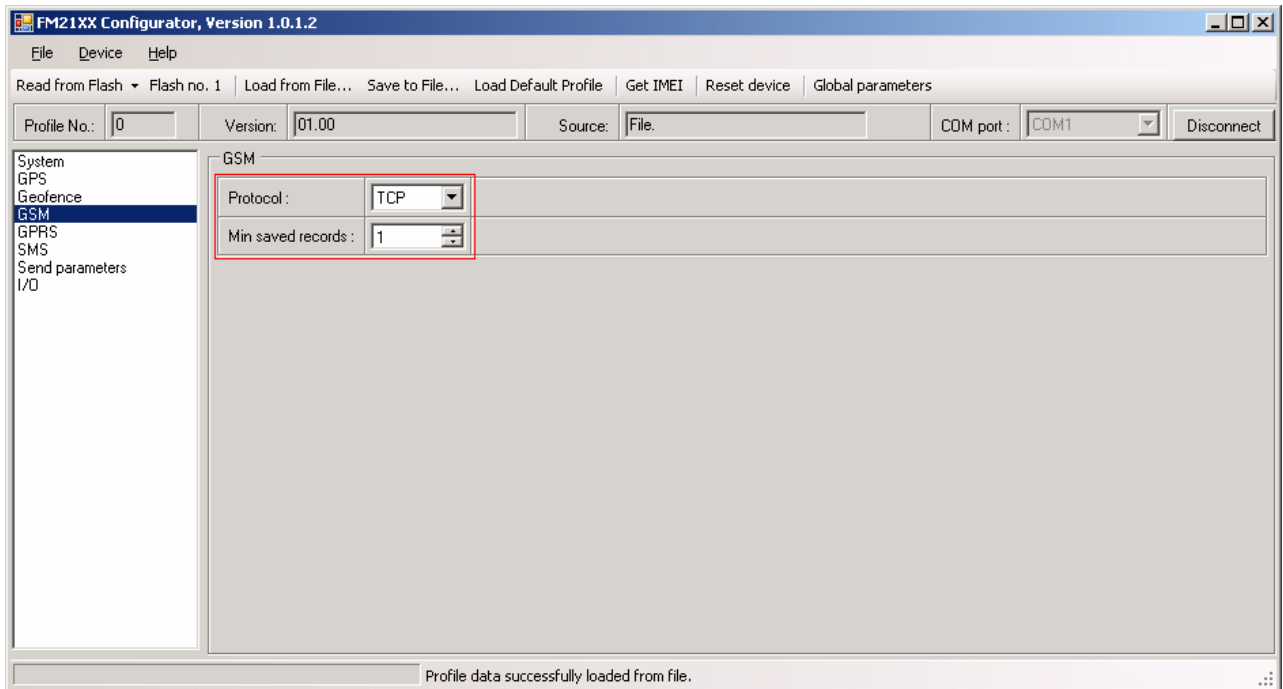

2.3 GPS settings

'GPS Settings' should have GPS set to 'Enabled'. 'Min. Period' defines a time interval to make a new record, 'Min. Distance' defines a distance interval to make a new record and 'Min. Angle' defines angle change compared to previous coordinate to make a new record. All these settings are active and FM2 is using them all to record new coordinates. By default time interval should be used to set interval for object when it is not moving, distance should be used to determine maximum distance between points when vehicle is moving in a straight line and angle should serve as precision corrector. If less detailed track is needed, angle can be set to higher value and only distance interval may be used.
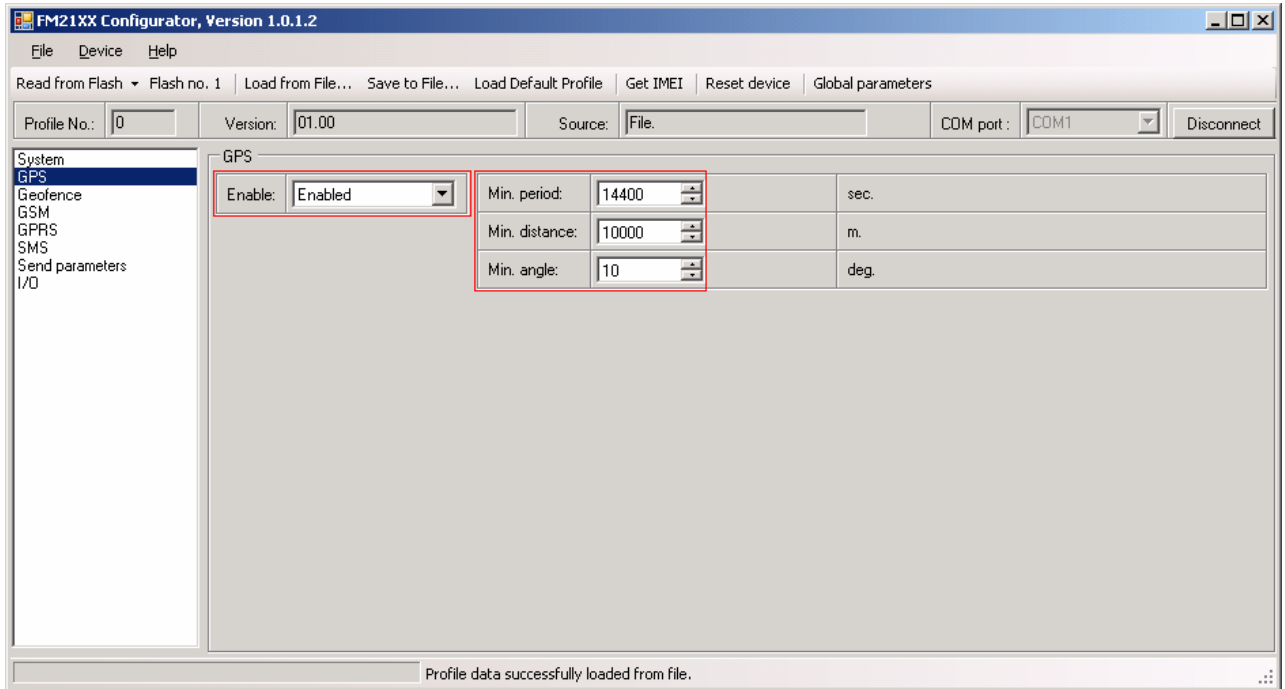
2.4 GSM settings

'GSM Settings' allows to set protocol used for data transfers – TCP or UDP. 'Min Saved Records' defines minimum number of coordinates that should be transferred with one connection to server. If FM2 does not have enough coordinates to send to server, it will check again after time interval defined in 'Sending Period' (see below).

2.5 GPRS settings

'GPRS Settings' define two main parameters for FM2: GSM operator APN and GPRS username and password (optional – depending on operator), and destination server IP and port.

Some operators use specific authentification for GPRS session – CHAP or PAP. If any of these is used, APN should be entered as '`<APN>:c`' or '`<APN>:p`'.

I.e. if operator is using APN 'internet' with CHAP authentification, it should be entered as '`internet:c`'.

Information about APN and authentification type should be provided by your GSM operator.
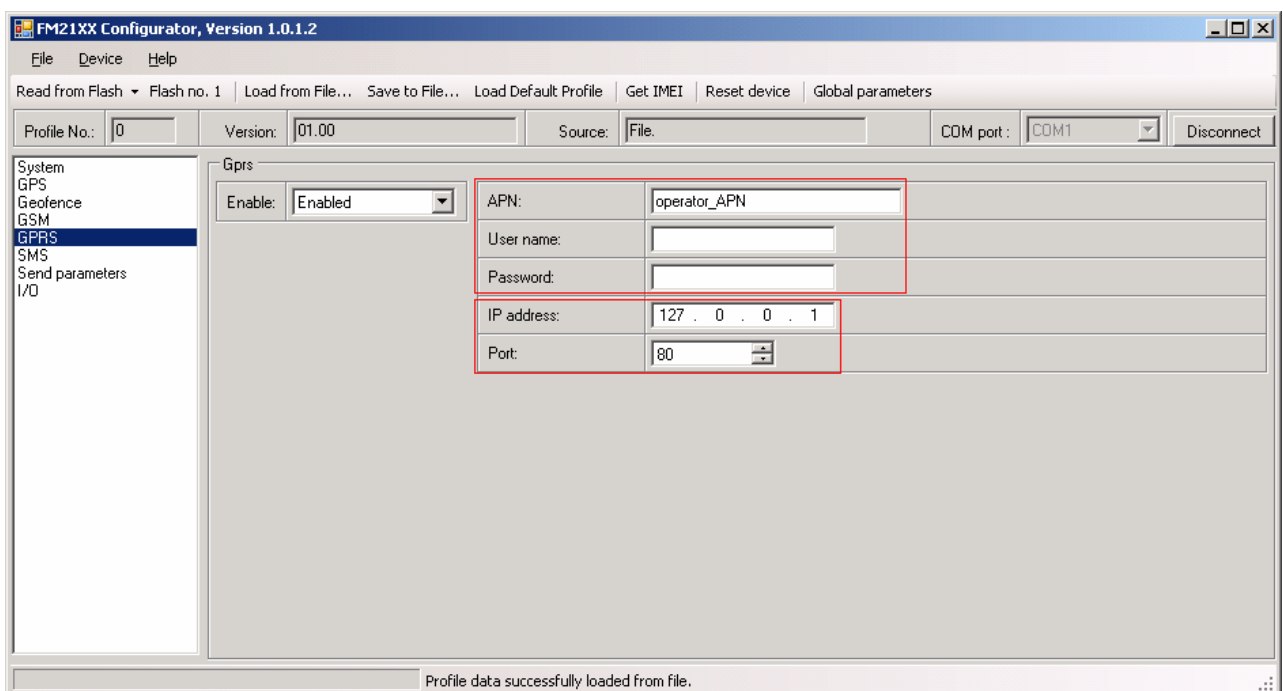
2.6 SMS Settings

Essential fields in 'SMS Settings' are 'Login' and 'Password'. This login and password should be used with every SMS sent to FM2 as identifiers and means of protection from SMS from unauthorised numbers. More information about SMS sending can be found in 'FM2 SMS Command List' document.
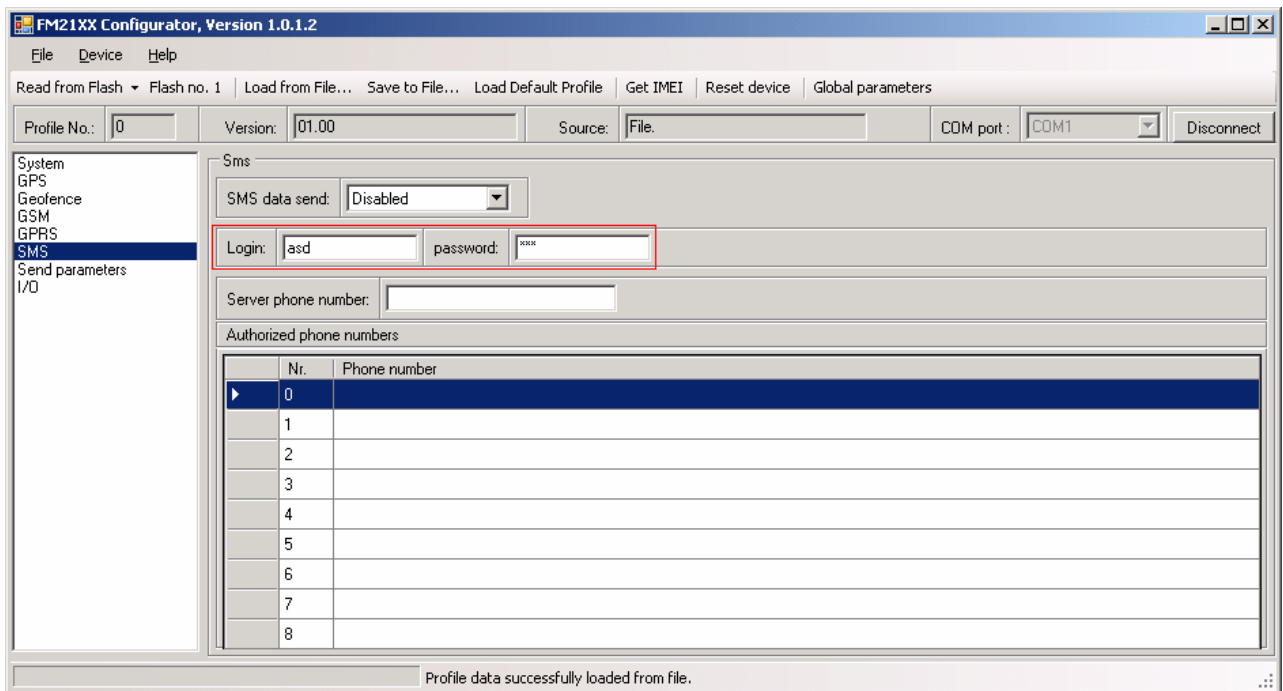
'SMS Data Send' field defines if FM2 is able to send periodic data and high priority event SMS to the server. Note, that it does not prevent FM2 from sending back replies to configuration commands or requests. Periodic data messages are sent in binary format to number specified in 'Server Phone Number' field.

If any number is entered in 'Server Phone Number' field, then that number is considered as only number authorised to send SMS – FM2 will discard all messages received from other numbers. More numbers can be added in 'Authorized Phone Numbers' list (up to 8).
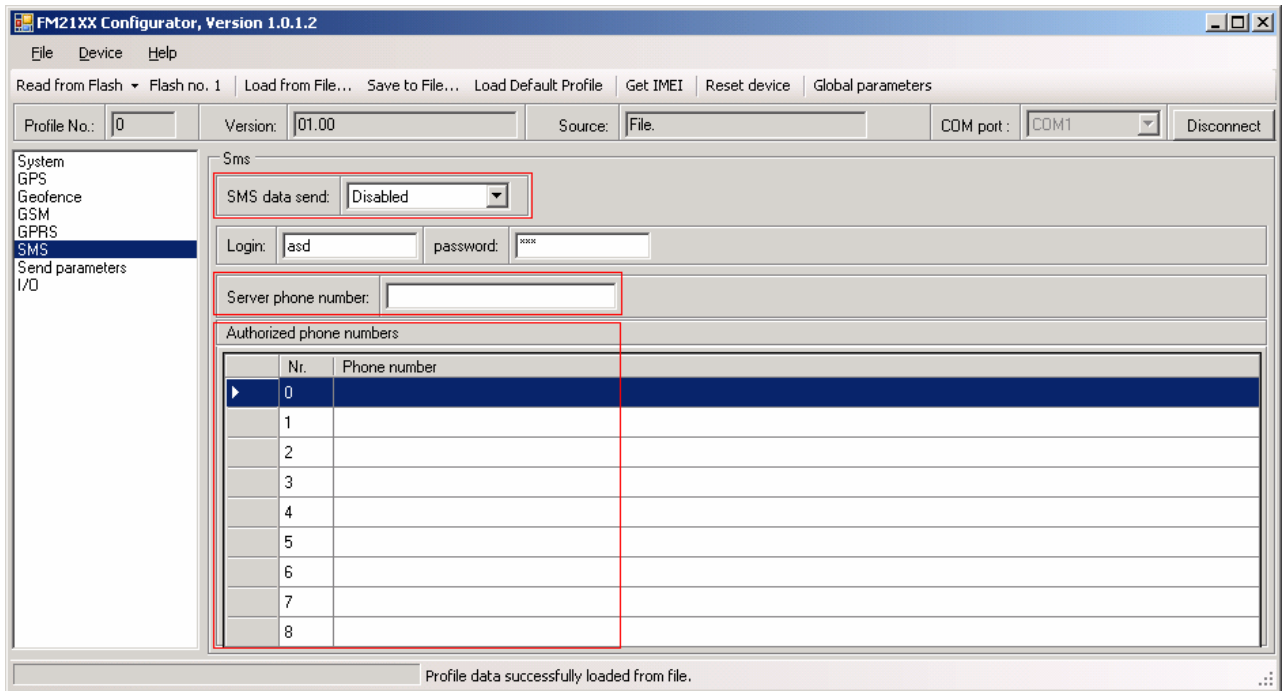
2.7 Send parameters

'Send Parameters' contains main information about data transfer. 'Send Period' defines time interval for FM2 to check if it has enough coordinates (number defined by 'Min. Saved Records' in 'GSM Settings') and if so – open connection with server and send them.

Before data link with server is opened, FM2 checks if GPRS connection is available. If not, then it checks if it can be opened: 'Send Week Time' table indicates when new GPRS connection can be opened. FM2 algorithm allows to open new GPRS session if current time is less than 10 minutes before nearest checked timestamp, therefore if all table is checked, FM2 is always allowed to open new GPRS session.

FM2 is able to use GPRS transfers only if currently used operator is entered in 'Operators List'. Usually home network code and roaming partner codes are entered in this list. If FM2 connects to an operator that is not included in the list, it is not able to use GPRS no matter what 'Send Week Time' table indicates.

Starting with FM2 firmware version 0.01.34, if no operator codes are entered in the list, then FM2 is able to use GPRS context with all operators. If at least one operator is entered, then FM2 is limited to use GPRS only with listed operators.
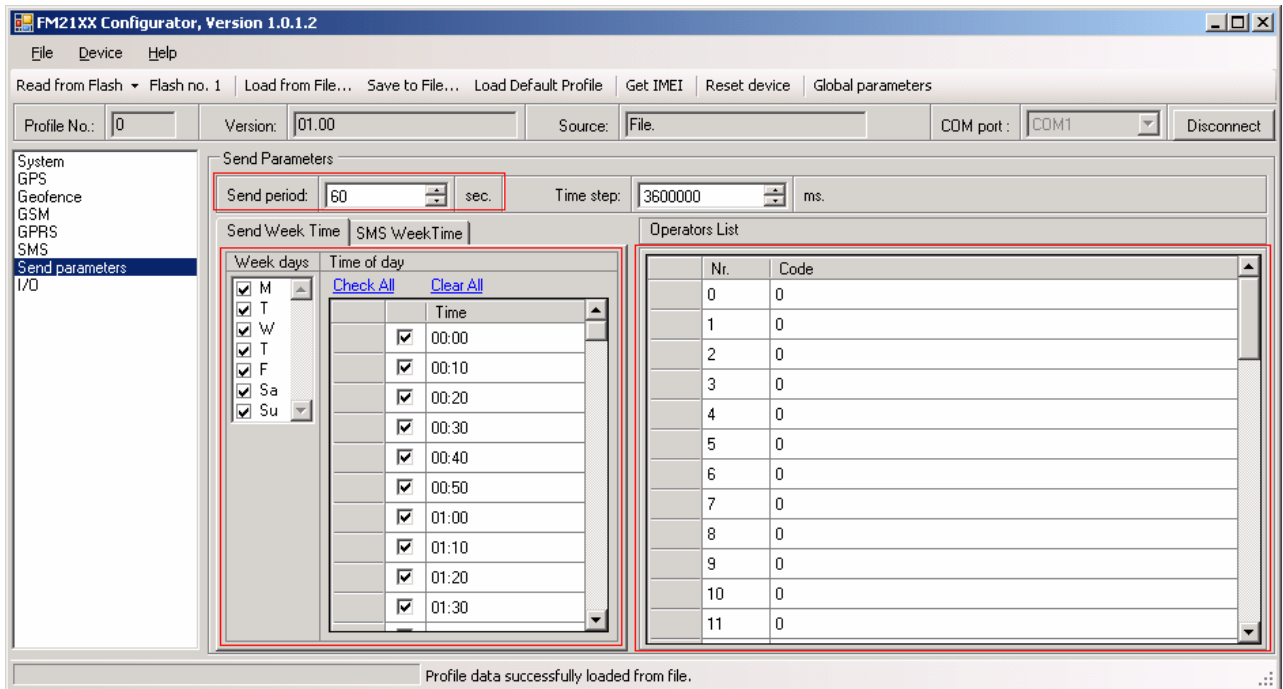
'Time Step' field indicates a time interval between 24 coordinates sent as binary SMS. I.e. if value is 3600000, then coordinates will be sent with every hour interval.

2.8 I/O elements

IO elements are additional data that can be sent with usual GPS data. These can be input or output status, power supply voltage, odometer reading, etc. To add any additional property, it has to be enabled.
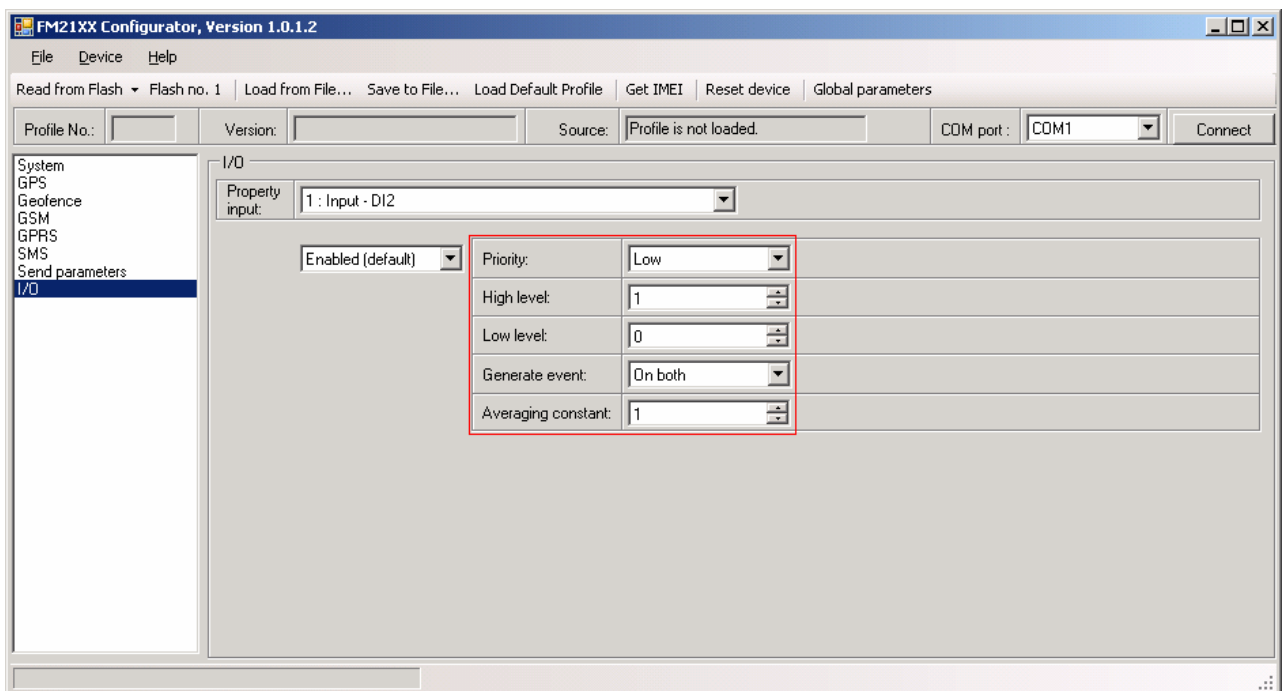
The following fields are used for event configuration: low and high level define a possible value range. When current value drops below low value or raises above high level (or value returns to defined range) FM4 checks 'Generate Event' field to see if value change triggered an action. Action priority can be low or high. When low priority event is triggered FM4 makes one additional record with indication that reason for that was IO element change. High priority also makes additional record, but it is also sent to the server immediately using GPRS (all remaining records are sent as well). If GPRS is not available, FM4 will try to send this information using 24 coordinate binary SMS (if 'SMS sending' in 'SMS settings' is enabled – see above).

3. FM2 debug mode

FM2 is able to transmit its current state when connected to PC using PORT1 cable. It is used to detect errors and provide information to possible solutions when operating as unexpected. Download Terminal from: http://213.226.139.30/Downloads/Software/Terminal.rar. After launching it choose baud rate 115200 and hardware control – none. Click on 'Start Log' button and save a new file. Then click 'Connect' to start receiving messages from FM2.
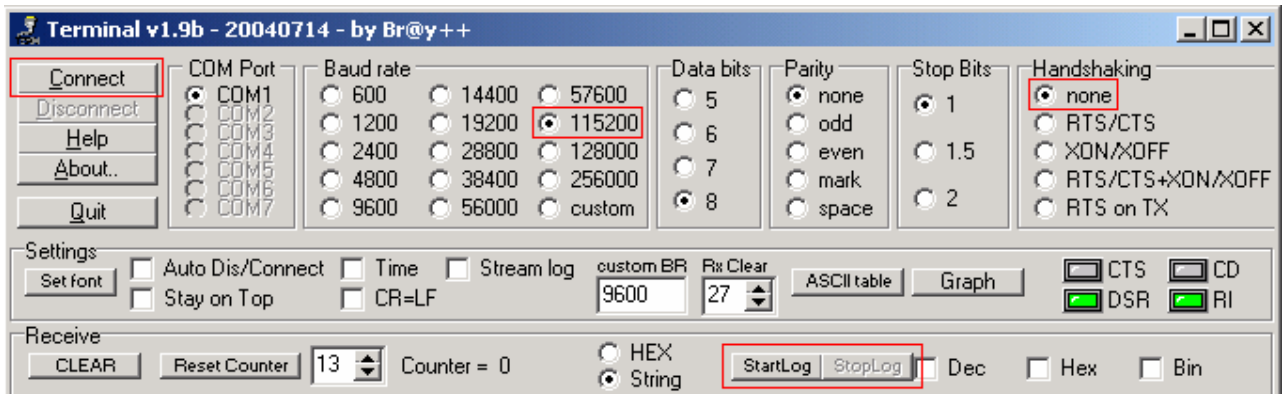
4. Compatibility

FM2 uses FM4 data protocol as well as configuration protocol. Some property IDs have changed – new properties are listed in FM2 parameter and functionality description.

5. Changes LogSheet

Nr.	Date	New version number	Comments
1	080507	1.1	SIM card notification added
2	080703	1.2	Power supply connector pinout fixed
3	080806	1.3	Send parameters chapter updated.