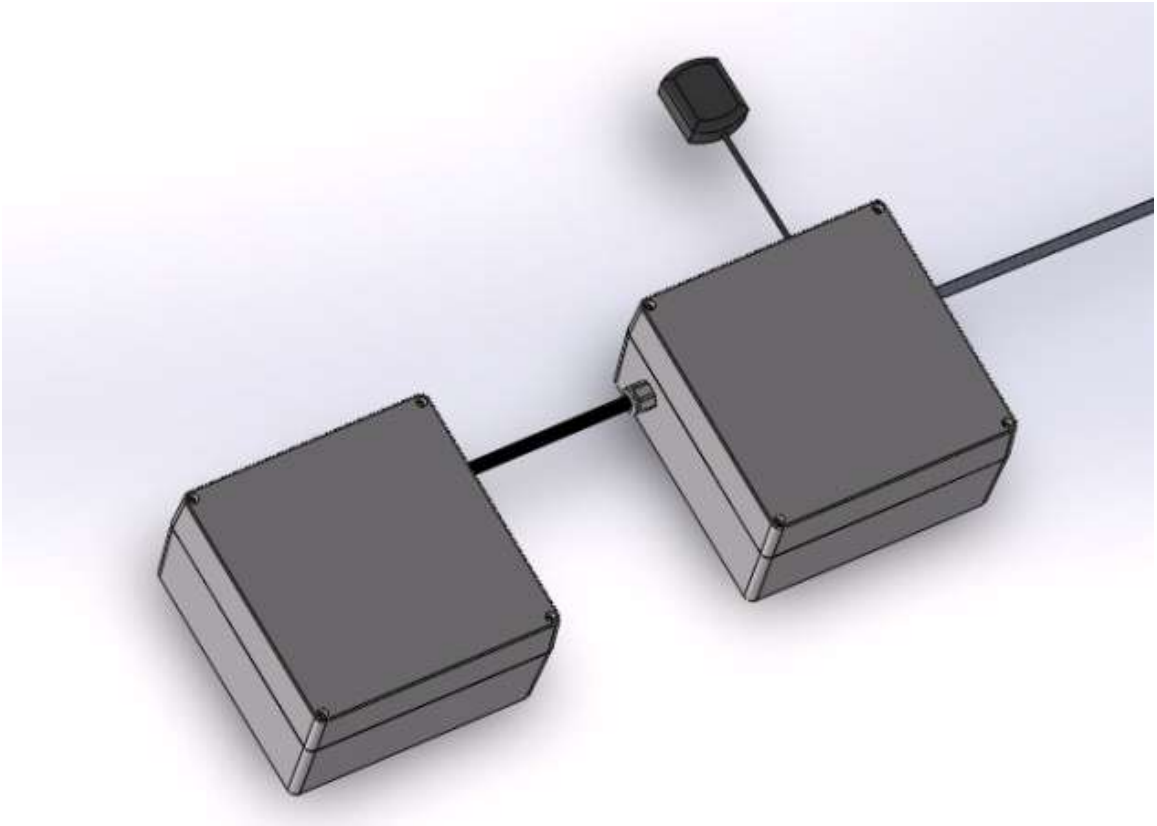


AKF301 User Manual
V1.3

Table of contents

1 INTRODUCTION

1.1 Attention

Do not disassemble the device. If the device is damaged, the power supply cables are not isolated or the isolation is damaged, before unplugging the power supply, do not touch the device.

All wireless data transferring devices produce interference that may affect other devices which are placed nearby.

The device must be connected only by qualified personnel.

The device must be firmly fastened in the predefined location.

The programming must be performed using a second class PC (with autonomic power supply).

The device is susceptible to water and humidity.

Any installation and/or handling during a lightning storm are prohibited.

1.2 Instructions of safety

This chapter contains information on how to operate AKF301 safely. By following these requirements and recommendations, you will avoid dangerous situations. You must read these instructions carefully and follow them strictly before operating the device!

The device uses two different power supplies, a 12V and 24V DC power supply. To avoid mechanical damage, it is advised to transport the AKF301 device in an impact-proof package.

When connecting the connection cables to the vehicle, the appropriate jumpers of the power supply of the vehicle should be disconnected.

Before dismounting the device from the vehicle, the connection cables must be disconnected.

The device is designed to be mounted in a zone of limited access, which is directly inaccessible for the operator. All related devices must meet the requirements of standard EN 60950-1.

1.3 Legal Notice

Other products and company names mentioned here may be trademarks or trade names of their respective owners.

The manufacturer reserves the right to make changes and/or improvements at any time in design, functionality, parameters and electrical characteristics without any prior notice and without incurring obligations.

2 BASIC DESCRIPTION

AKF301 main purpose is to provide additional, rechargeable power supply source for FM devices. Furthermore AKF301 provides:

- 12V overvoltage protection
- IP65 protection level for FM4200, FM1100 or FM5300 device
- Vibration protection
- Additional AKF301 PCB protection from excessive humidity

AKF301 solution consists of two boxes. First box contains FM device and external battery charge circuit. The second box contains additional external battery, which is +12V 7Ah. Dimensions of both boxes are 160x160x90 mm. For freezer truck trailer option, AKF301 is in separate from FMXXXX box which dimensions are 85x130x38mm.

2.1 Package contents

The AKF301 device is supplied to the customer in a cardboard box containing all the equipment that is necessary for operation. The package contains:

One of FM1100, FM4200, FM5300 device (optional);
AKF301 device;
7Ah +12V external battery;
Input and output power supply cable with a 2x5 or 2x10 connection pins (dependent on FM4200, FM1100 or FM5300 device option);
Two boxes, one for AKF301, and another for external battery;
2 wire cable with 2A fuse, for connecting AKF301 with external battery;
Eight wires power cable;

2.2 Basic characteristics

- Two AWO603 boxes with dimensions of 160x160x90 mm (for freezer truck trailer option, AKF301 is in separate from FMXXXX box which dimensions are 85x130x38mm.)
- 2A fuse on +12V input line
- 2A RUEF self-resetting fuses on +24V line
- 2A fuse for additional external battery
- +12V line overvoltage protection
- Operation on external battery up to 25 days (dependent on configuration)
- External battery full charge time 10 Hours

Inputs:

- 12V input (+12V & GND)
- 24V input (+24V & GND)
- Additional 12V input for external battery (+12V & GND)

Outputs:

- 13V output for FM device (+13V & GND)
- Power supply for FM device LED indication

2.3 Technical features

- Storage temperature from -25° C to +55° C
- Relative humidity from 0 to 90% (without condensate)

2.4 Electrical characteristics

VALUE / CHARACTERISTIC DESCRIPTION	Min.	Typ.	Max.	Unit
Supply Voltage:				
Supply Voltage for 12V line	11		15	V
Supply Voltage for 24V line (Recommended Operating Conditions)	20		30	V
Output Supply Voltage:				

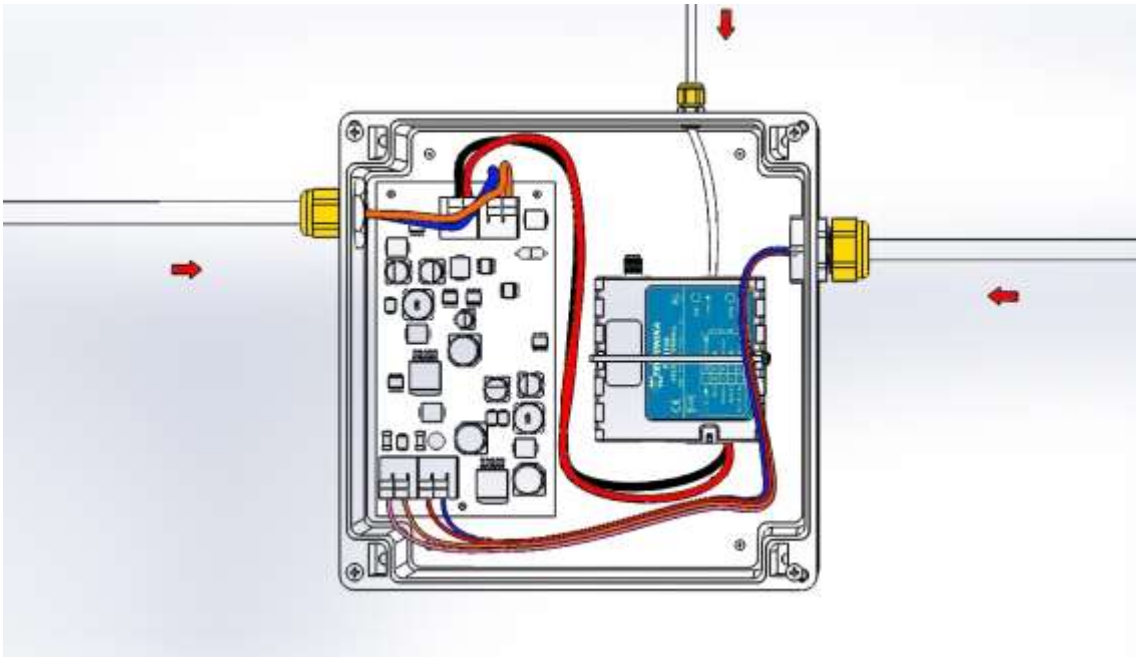
Supply Voltage	12		14	V
Operation time from AKF301 battery:				
Record saving and sending every hour			48	hour
Record saving and sending once in a 24 hours in deep sleep mode			25	days

For FM1100, FM4200 or FM5300 device`s electrical characteristics please refer to corresponding user manual.

3 CONNECTION, PINOUT, ACCESSORIES

3.1 AKF301 power cable connection

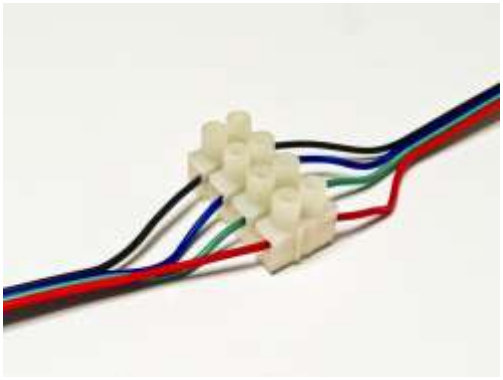
Wire color	Description
Red	+24V for 24V power supply line
Blue	GND for 24V power supply line
Pink	+12V for 12V power supply line
Brown	GND for 24 power supply line and 1-wire



- Push through GPS antenna`s, external battery`s and power cables
- Tighten all three nuts (marked yellow in the picture)
- Connect red and black wires from FMXXXX to AKF301 OUT(+) and GND(-) as shown in the picture above

- Connect blue and brown wires from external battery to AKUM+ and AKUM- as shown in the picture above
- Connect red, blue, brown and pink cables as shown in the picture above

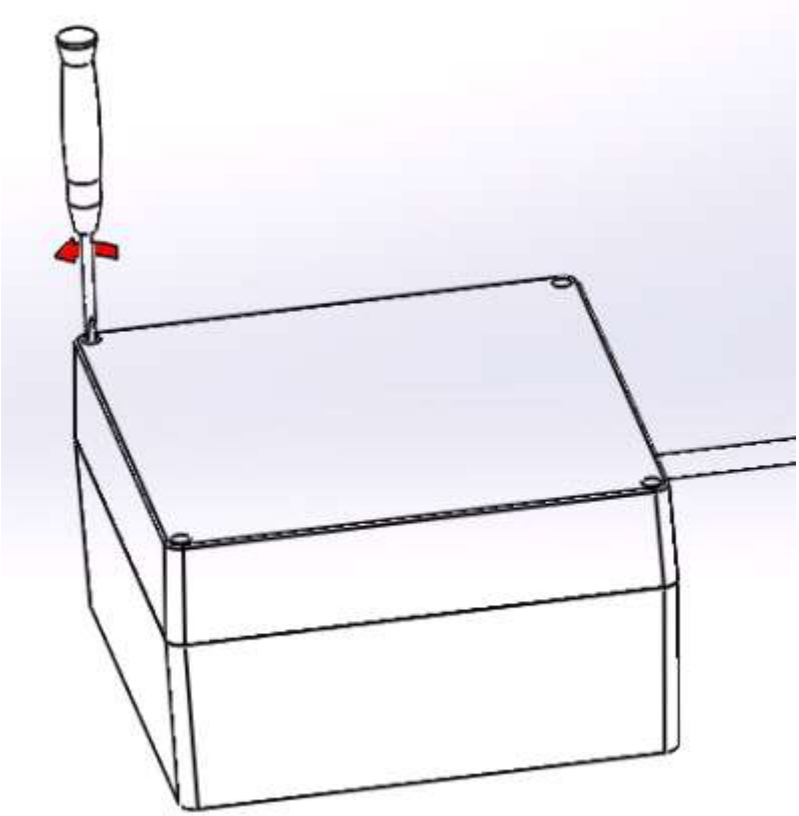
There are four extra wires in the power cable, so you can connect up to four inputs/outputs of FMXXXX device. For wires in power cable and FMXXXX inputs/outputs connection use connection block

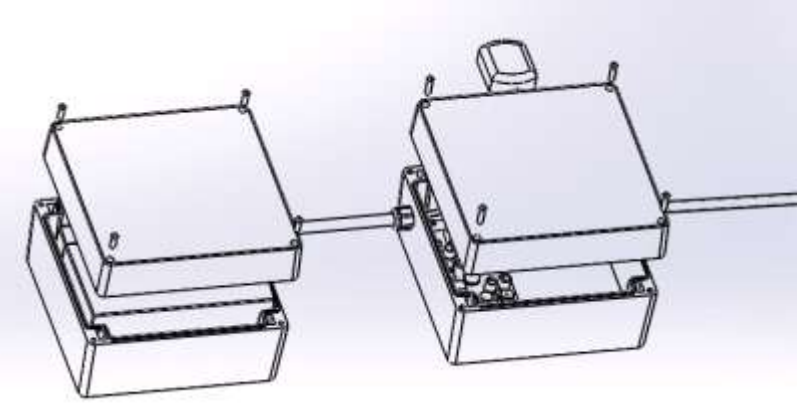


3.2 Getting started

Before start using AKF301 these steps must be taken:

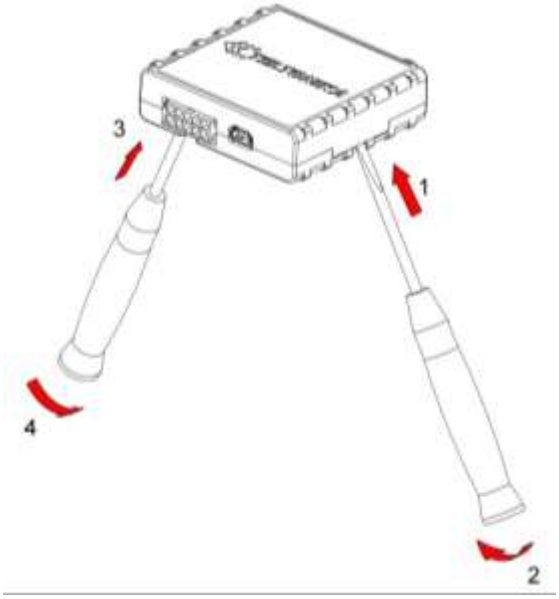
1. Unscrew both boxes and take off covers





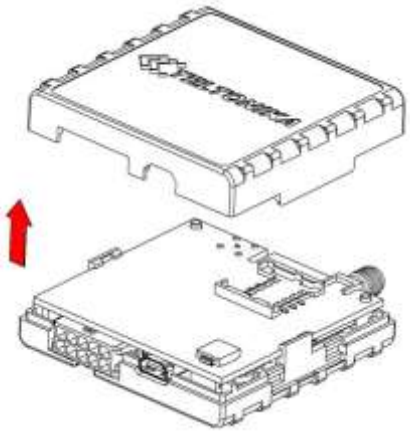
2. SIM card insertion:

a. How to insert SIM card into FM1100 device:



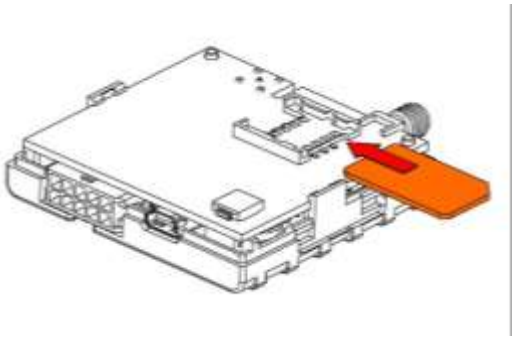
①

Gently open FM1100 case using screwdrivers



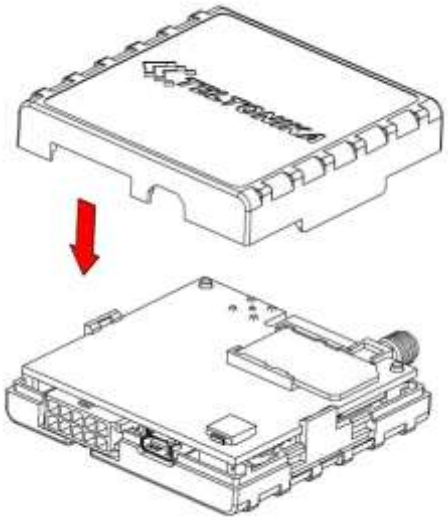
②

Remove FM1100 case



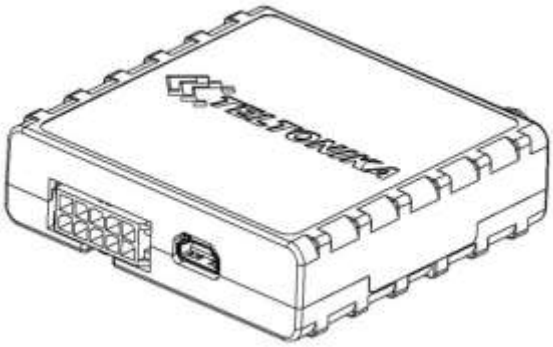
③

Insert SIM card as shown



④

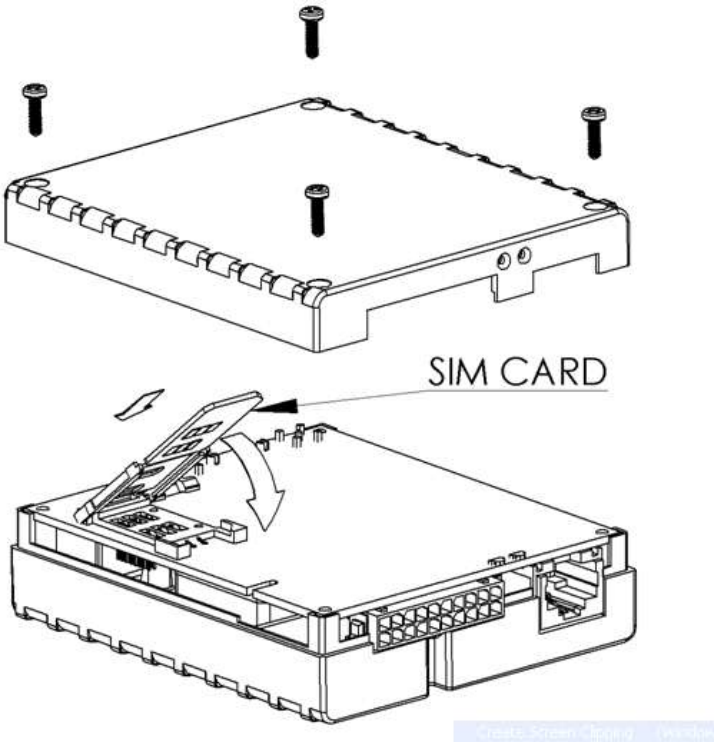
Attach top housing cover



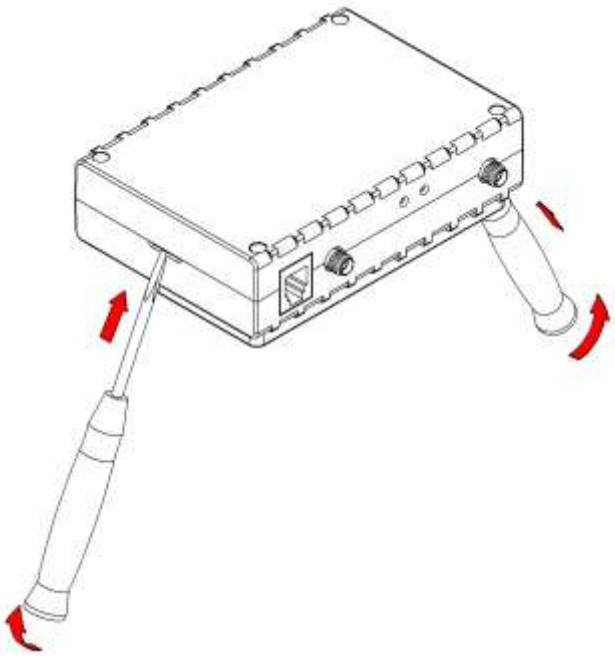
⑤

Device is ready

b. How to insert SIM card into FM4200 device:

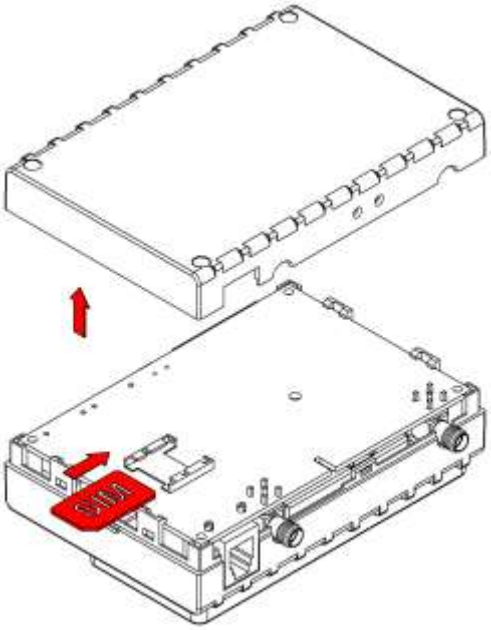


c. How to insert SIM card into FM5300 device:



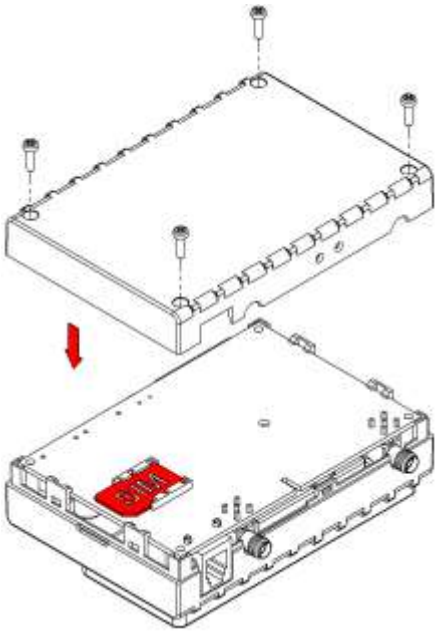
①

Gently open FM5300 case using screwdrivers



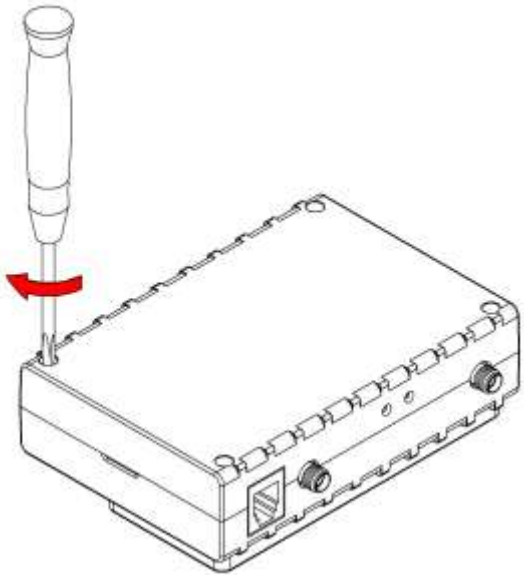
②

Take off FM5300 case and insert SIM card as shown



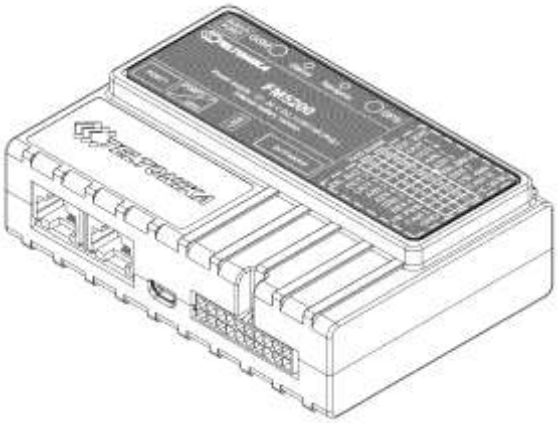
③

Assemble device as shown and put screws into the holes



④

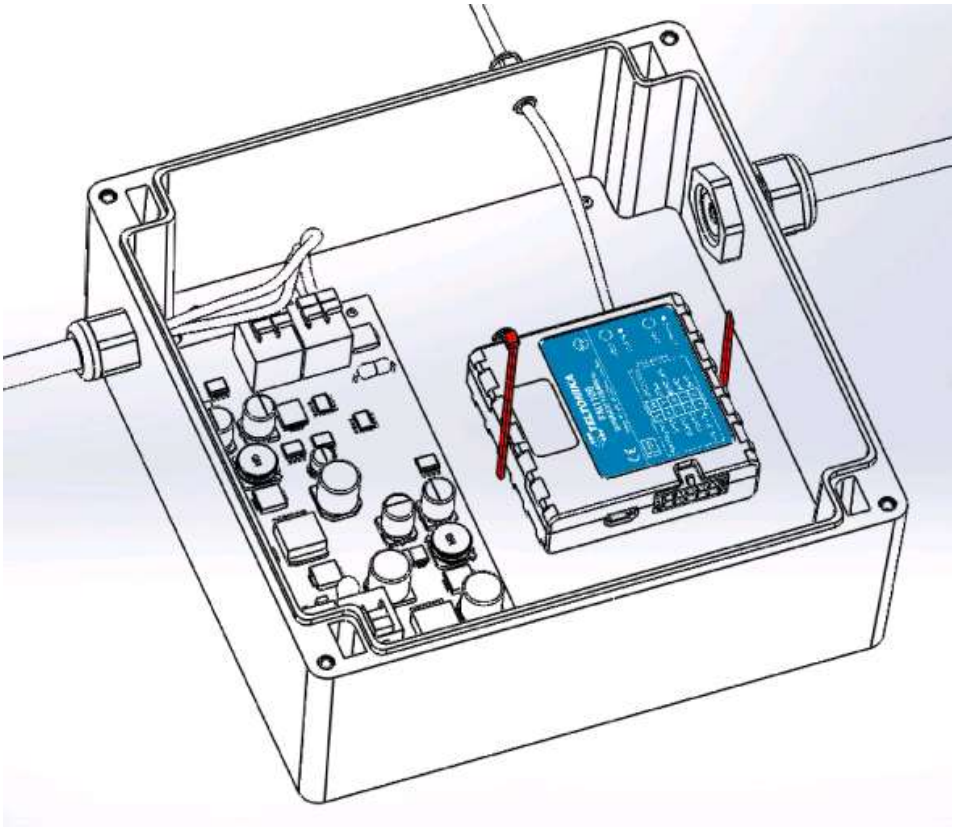
Screw all 4 screws



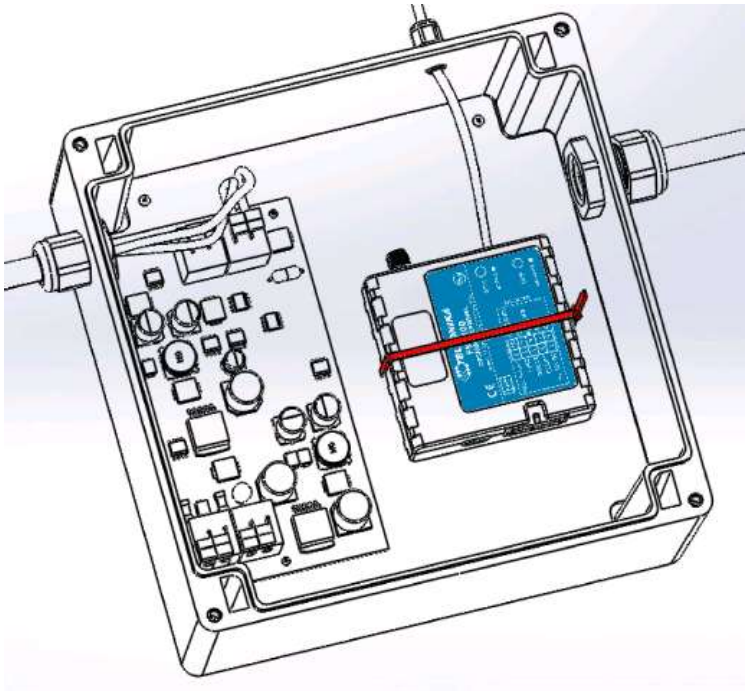
⑤

Device is ready

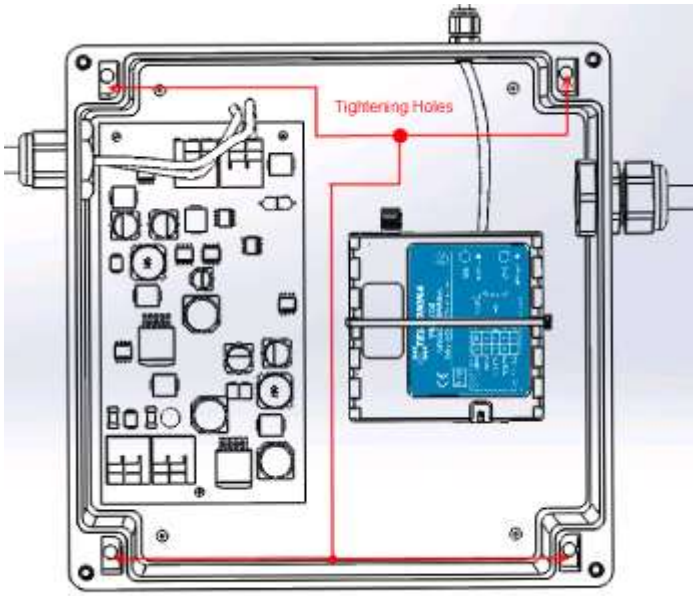
3. Glue FM1100, FM4200 or FM5300 box with double sided adhesive tape to metal panel as shown below



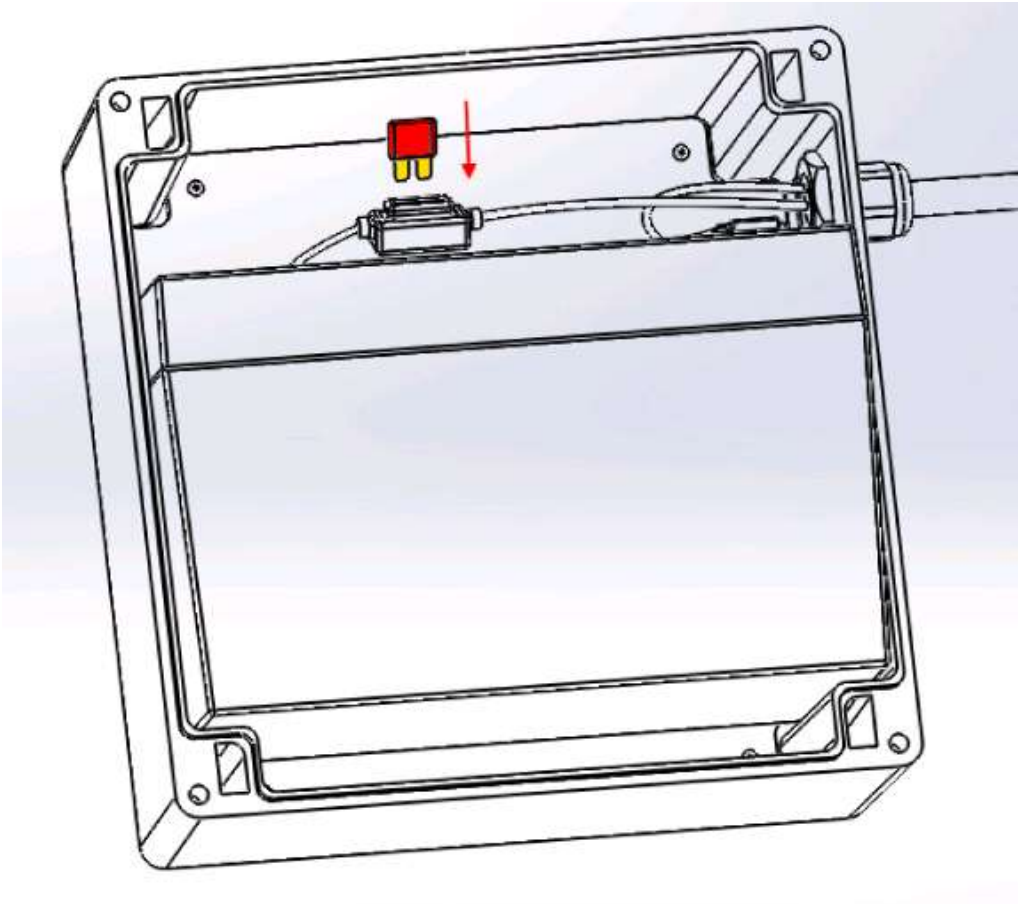
4. Tighten FM1100, FM4200 or FM5300 with plastic strap



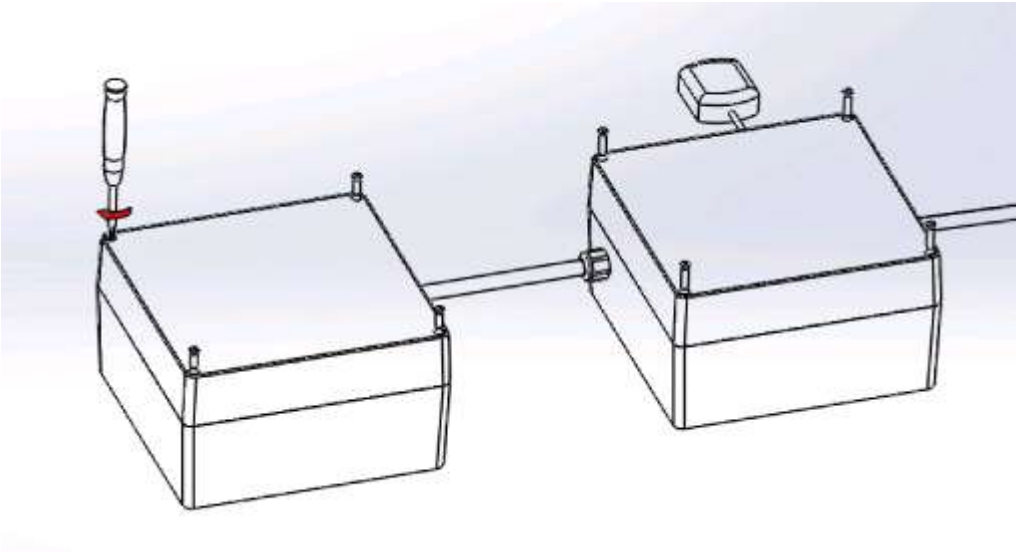
5. Tighten both boxes to platform where AKF301 will be used



6. Connect power supply and used input/output cables
7. Make sure system started to work, and LED on AKF301 pcb lights
8. Insert 2A fuse in fuse holder near the external battery



9. Close and screw both boxes



3.3 Optional inputs/outputs

If you want to use the rest of FM1100, FM4200 or FM5300 devise`s inputs/outputs, TELTONIKA can install additional cable to AKF301 box by demand.

4 Possible usage scenarios

4.1 Freezer truck trailer

AKF301 receives power supply from truck +24V line, then it is charging it's external battery and supplying power from truck battery to FM device. When freezer is detached from truck, AKF301 is supplying power from freezer`s +12V battery to FM1100, FM4200 or FM5300 device and additional external battery is not charged. Then using this scenario, truck battery must be connected to 24V line and freezer`s battery must be connected to 12V line in AKF301 device.

4.2 Regular truck trailer

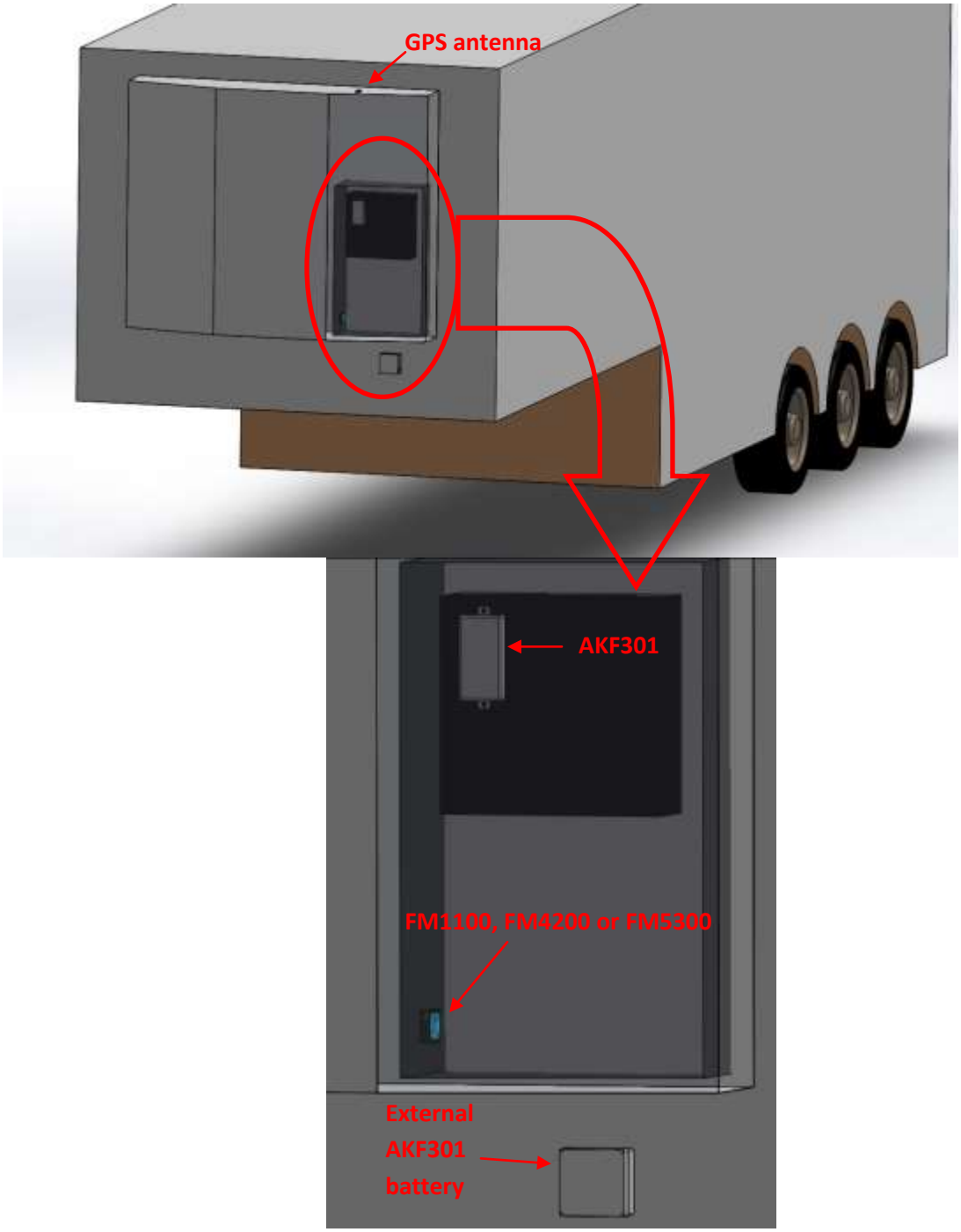
AKF301 receives power supply from truck`s 24V battery, then it is charging it's external battery and supplying power from truck to FM device. When trailer is detached from truck, AKF301 is supplying power to FM from it's additional external battery. Then using this scenario, truck battery must be connected to 24V line. 12V line is not used, except for 1-wire GND.

4.3 Platform truck trailer

Usage for this scenario is the same as in Regular truck trailer scenario.

5 Mounting recommendations

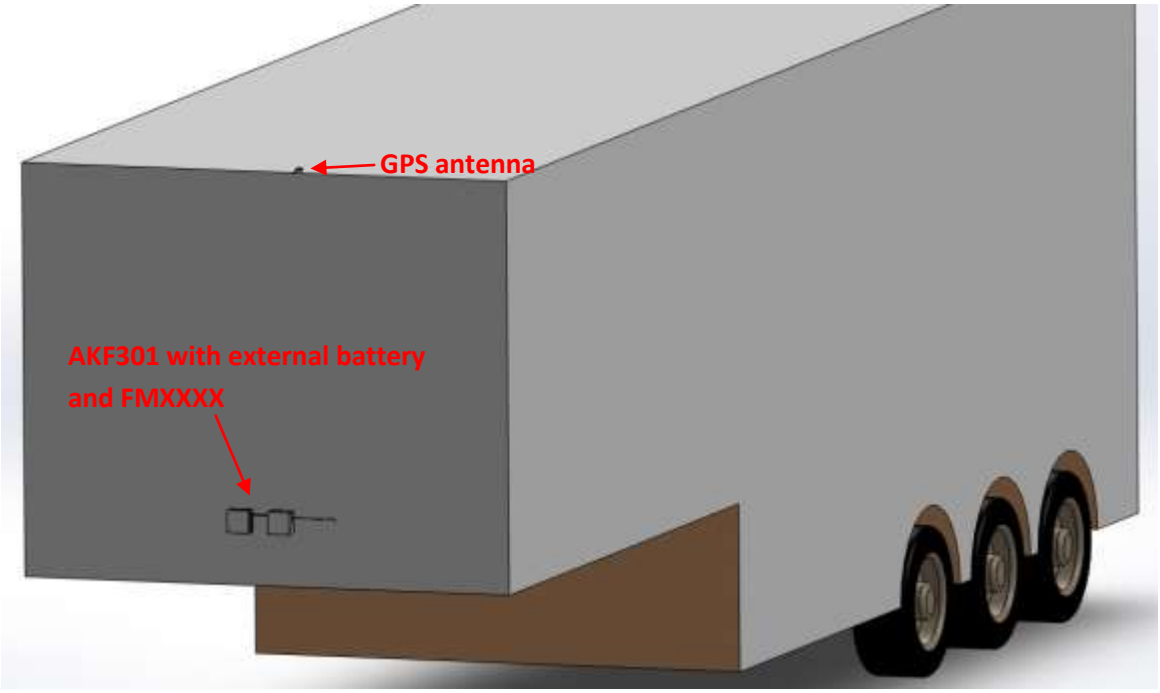
5.1 For Freezer truck trailer



AKF301 and FM1100, FM4200 or FM5300 device should be mounted inside refrigerator's electrical box. External AKF301 battery should be mounted under refrigerator's electrical box. GPS

antenna must be placed so it would have clear view of sky. GSM antenna should be left inside of the box with FM1100, FM4200 or FM5300 device. Power supply must be connected to the constant power supply line of the truck.

5.2 Regular truck trailer



Box with AKF301 and FM1100, FM4200 or FM5300 device should be mounted close to box with external battery at the front of truck trailer. GPS antenna must be placed so it would have clear view of sky. GSM antenna should be left inside of the box with FM1100, FM4200 or FM5300 device. Power supply must be connected to the constant power supply line of the truck.

6 Checklist after installation

- After full installation and power on check if FMXXXX device started to work (LED is blinking)
- Wait until GPS LED starts to blink
- Disconnect main power supply form truck and make sure FMXXXX still works from external AKF301 battery
- Make sure server receives data from FMXXXX device
- Check if all nuts are tightened and boxes are closed tightly

7 CHANGE LOG

Nr.	Date	Version	Comments
1	2014-09-19	1.0	Preliminary draft release.
2	2014-09-26	1.1	Added pinout screens
3	2014-09-29	1.2	Added power consumptions rates
4	2014-10-01	1.3	Minor text changes
5	2014-12-08	1.4	Minor text changes