RUPTELA

GPS/ GSM Terminal

Model: FM-Eco3

MANUAL

V2.2

Content

1. INTRODUCTION

1.1. SAFETY REQUIREMENTS

All the associated (additional) equipments as PC, batteries, sensors and others, shall meet the requirements of standard EN60950-1.

Do not disassemble the Terminal. If the enclosure of Terminal is damaged, or the insulation of wires is damaged, first of all unplug the 10 pins connector from the Terminal carefully.

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

The Terminal can be installed or dismounted only by qualified personnel!

The Terminal must be firmly fastened in the predefined location. Predefined location is explained in the Mounting instructions.

The programming must be performed using a 2nd safety class of PCs (with autonomic power supply).

Be sure the Terminal is installed in the place where it cannot be reached by water drops and humidity.

Caution! Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

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

Use cables provided with FM-Eco3 Terminal.
Ruptela is not responsible for any harm caused by using wrong cables for PC <-> FM-Eco3 connection.

Attention! Do not connect wrongly the wires marked (+ battery) and (chassis) to battery poles. If poles are mixed, the will broke.

To disconnect the Terminal from power supply, you need to disconnect 10 pins plug and plug for internal battery.

This chapter contains information on how to operate FM-Eco3 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 ! The Terminal is supplied from a car battery with its ratings: 12/24V ⎓ 1A/500mA. The allowed voltage range for battery: 10…32V DC.

To avoid mechanical damage, it is advised to transport the Terminal FM-Eco3 in an impact-proof package.

Before connecting any pins of 10 pin plug to the vehicle, ensure that plug is disconnected from the Terminal. Be sure that cross-sectional area of mounting wires is at least 0.75 mm^2.

To dismount Terminal correctly from the vehicle, first of all disconnect 10 pins plug and only then other plugs or interfaces can be disconnected.

The Terminal is intended to be installed in a restricted access location, which is inaccessible for the operator. The Terminal FM-Eco3 is not intended to be used for boats.

1.2. LEGAL NOTICE

1.3. ACRONYMS:

- PC – Personal Computer.
- GPRS – General Packet Radio Service.
- GPS – Global Positioning System.
- GSM – Global System for Mobile Communications.
- SMS – Short Message Service.
- AC/DC – Alternating Current/Direct Current.
- Record – Data stored in FM-Eco3 memory. Data contains GPS and I/O Information.
- LED – Light Emitting Diode.
- I/O – Inputs / Outputs.

2. BASIC DESCRIPTION

FM-Eco3 is a Terminal with GPS / GSM connectivity, which is able to determine the object's coordinates and transfer them via the GSM network. This Terminal is perfectly suitable for applications where location acquirement of remote objects is needed. It is important to mention that FM-Eco3 has additional inputs and outputs, which lets controlling and monitoring other remote objects.

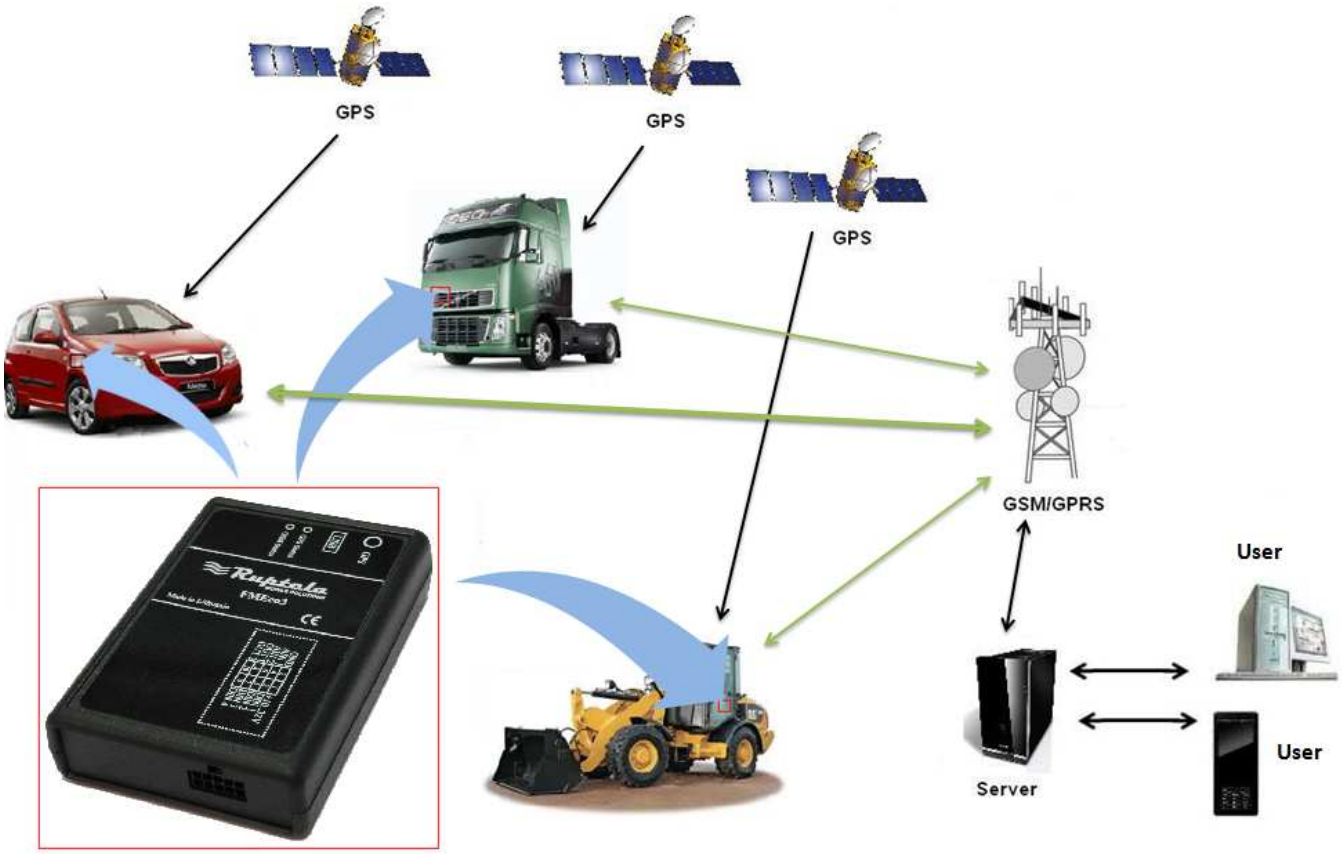


Figure1. Example of application of GPS/GSM TERMINAL FM-Eco3 for controlling and monitoring of remote objects

2.1. PACKAGE CONTENTS

Figure2. FM-Eco3 Terminal, Power cable and GPS antenna.

The FM-Eco3 Terminal is supplied to the customer in a cardboard box containing all the equipment that is necessary for operation. The package contains:

- The FM-Eco3 Terminal.
- 10 pin plug with wires for power supply and I/O connection
- Magnetic GPS antenna with sticker.

Note: *the manufacturer does not supply a SIM card in the package, which is necessary for connection to the GSM network! SIM card can be obtained from your local GSM service provider! SIM card can work with the Terminal only when all SIM card security codes are disabled!*

If any of the components are not in the package, please contact the manufacturer's representative or the vendor (www.ruptela.com).

2.3. BASIC CHARACTERISTICS

Inputs / Outputs:

IO1 – 10 pin (2x5 plug):

CHASSIS	2	1	+BAT 12/24V
AIN 1	4	3	DIN 1
AIN 2	6	5	DIN 2
OUT 1	8	7	DIN 3
OUT 2	10	9	DIN 4

Paired connections scheme:

Power supply

CHASSIS	2	1	+BAT 12/24V
AIN 1	4	3	DIN 1
AIN 2	6	5	DIN 2
OUT 1	8	7	DIN 3
OUT 2	10	9	DIN 4

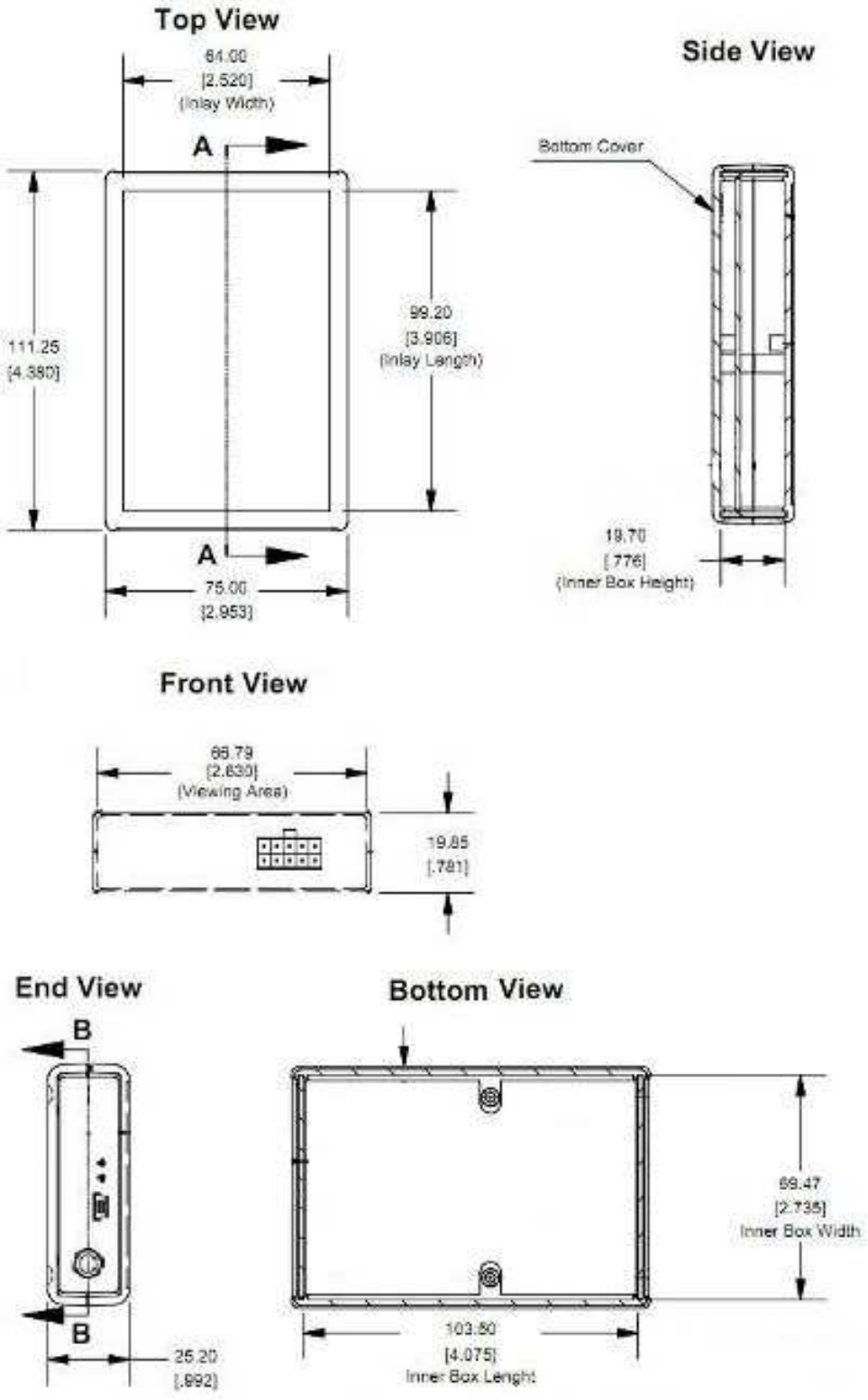
Other Inputs / Outputs are not paired.

2.4. TECHNICAL FEATURES:

Power supply	External Battery Ratings: +12/24V ⎓ 1A/500mA
Fuse	External fuse (mounted into +BAT wire): F 2AL
Dimensions	92.2 x 64 x 25.2 mm
Weight	110g
Temperatures	Operational temp.: -35°C ... +55°C Storage temp.: -40°C ... +65°C

GPS	Ublox module (with external GPS antenna)
GPRS/GSM	Simcom module (with internal GPS antenna)
Motion sensor	Micro vibration sensor
LED's	GPS fix led, GSM led, All LED's are green.
Mini USB	Mini USB socket
SIM	Sim card holder with lock
10 pin plug	Tyco multi-lock 4-794619-0 socket
Housing / Material	UL94-HB Plastic case

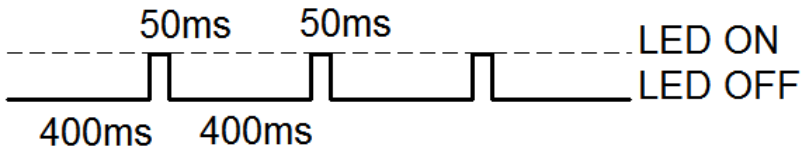
2.5. FM-Eco3 DIMENSIONS.



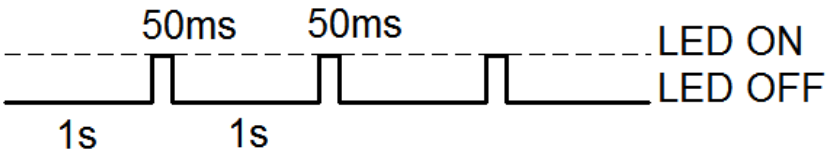
2.6. LED STATUSES:

GPS LED

When GPS signal is not received or GPS signal is not accurate, the GPS LED is blinking as follows:

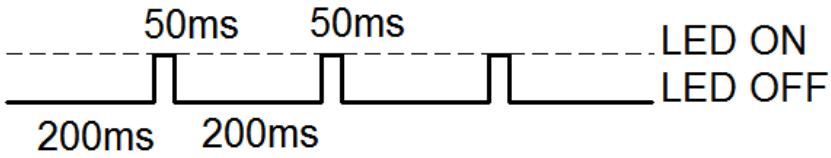


When accurate GPS signal is received, the GPS LED is blinking as follows:

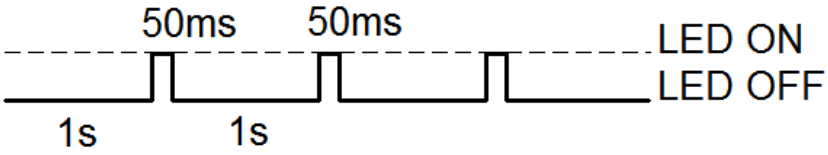


GSM LED

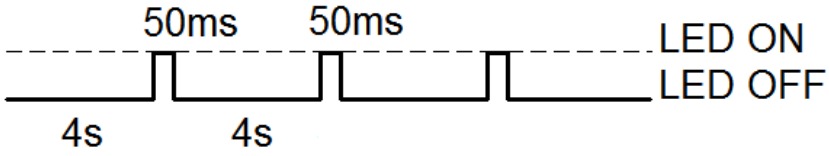
When GSM signal is not received, GSM led is blinking:



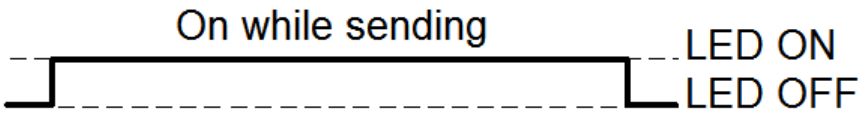
When Terminal has good GSM signal, but no GPRS, LED is blinking:



When Terminal has good GSM signal and it is connected to GPRS, then LED is blinking:

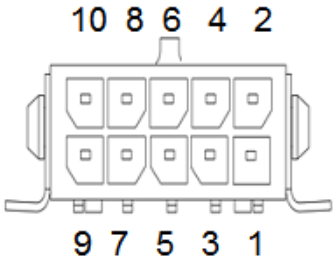


When the FM-Eco3 terminal has GSM signal and it is sending data via GPRS, LED is blinking:



2.7. PINOUT, CONNECTION:

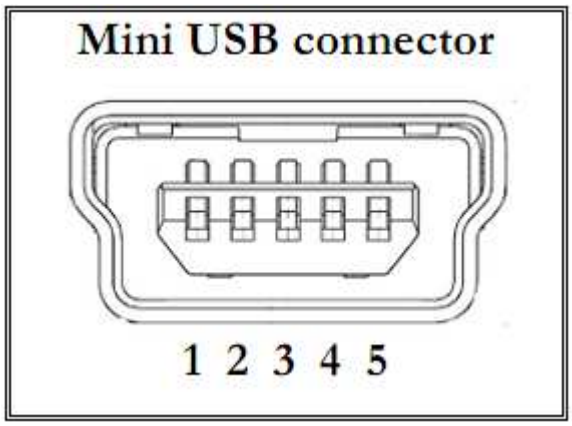
FM-Eco3 standard plug.



Standard FM-Eco3 10 pins plug description:

Pin No.	Pin name	Description
1.	+BAT 12/24V	Battery rated voltage: 12/24V. Allowed battery voltage range: 10...32V
2.	Chassis ⏚	The frame or chassis of a car
3.	DIN 1	Digital input, channel 1(It can be also used as a pulse counter). Threshold 4V
4.	AIN 1	Analog input, channel 1. Input range: 0 – 30V
5.	DIN 2	Digital input, channel 2(It can be also used as a pulse counter). Threshold 4V
6.	AIN 2	Analog input, channel 2. Input range: 0 – 30V
7.	DIN 3	Digital input, channel 3. Threshold 4V
8.	OUT 1	Digital output. Channel 1. Open collector output. Max. 32V ⎓ 250 mA
9.	DIN 4	Digital input, channel 4. Threshold 4V
10.	OUT 2	Digital output. Channel 2. Open collector output. Max. 32V ⎓ 250 mA

2.8. USB



Pin No.	Pin name	Description
1.	VCC	+5V
2.	D-	Data -
3.	D+	Data +
4.	⏚	Chassis

2.9. SPECIAL FEATURES:

• Any element event triggers (input, speed, etc.)

• Smart profile switching (GSM operator or any element dependant)

• Highly configurable data acquisition and sending

• Real-time process monitoring

• Authorized number list for remote access

• Firmware update via GPRS or Mini USB port

• Configuration update via GPRS, SMS or Mini USB port

• TCP/IP or UDP/IP protocol support

• 5 000 record storing

3. MOUNTING RECOMMENDATIONS

Connecting Wires

• Wires should be connected while module is not plugged in.
• Wires should be fastened to the other wires or non-moving parts. Try to avoid heat emitting and moving objects near the wires.
• The connections should not be seen very clearly. If factory insulation was removed while connecting wires, it should be applied again.
• If the wires are placed in the exterior or in places where they can be damaged or exposed to heat, humidity, dirt, etc., additional insulation should be applied.
• Wires cannot be connected to the board computers or control units.

Connecting Power Source

• Be sure that after the car computer falls asleep, power is still available on chosen wire. Depending on a car, this may happen in 5 to 30 minutes period.
• When module is connected, be sure to measure voltage again if it did not decrease.
• It is recommended to connect to the main power cable in the fuse box.

Connecting Ignition Switch of the vehicle

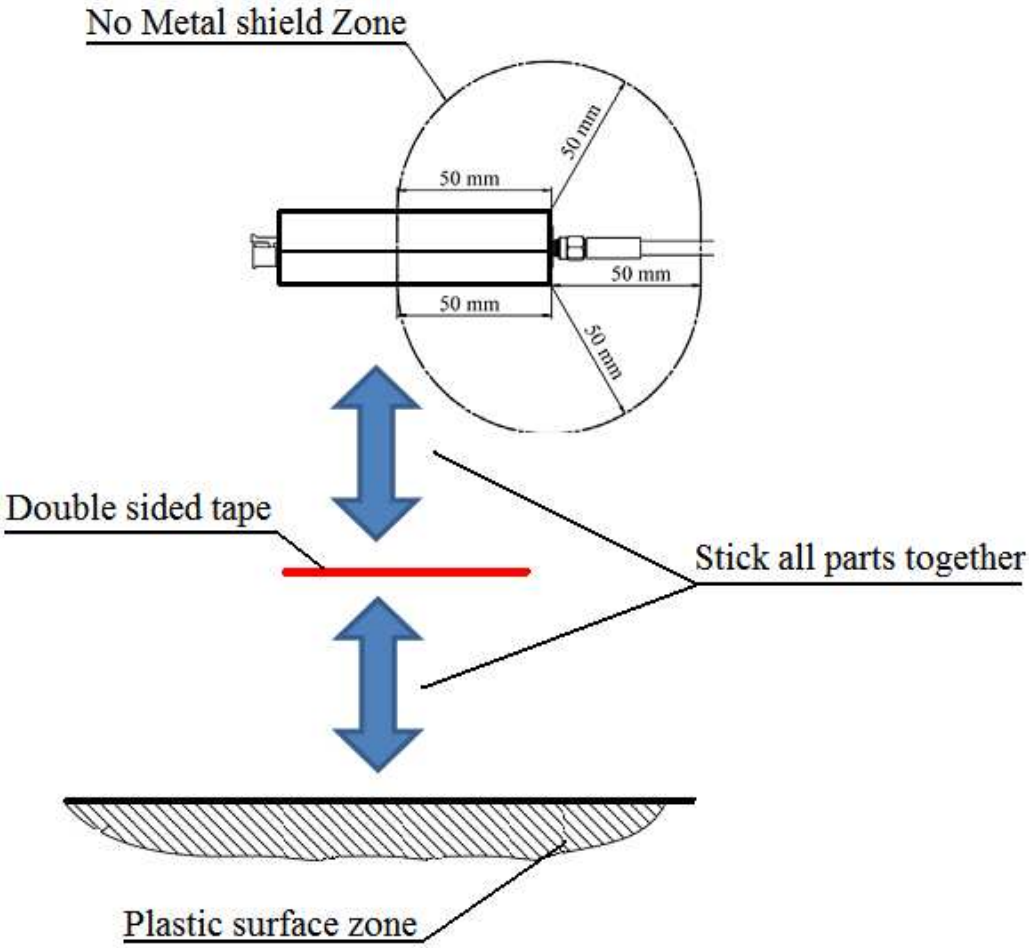
• Ignition Switch allows you to control the power to many of the car's accessories, preventing accessories from running down the car's battery when the car is parked for a long period of time. The Ignition Switch also serves the far greater purpose of connecting the starter to the battery, allowing the battery to send a powerful surge of electricity to the starter when the car is being started.
• Be sure to check if it is a real ignition switch wire – power does not disappear while starting the engine.
• Check if this is not an ACC wire (when key is in the first position, most electronics of the vehicle are available).
• Check if power is still available when you turn off any of vehicles devices.
• Ignition is connected to the ignition relay output. As alternative, any other relay, which has power output, when ignition is on may be chosen.

Connecting Chassis Wire

• Chassis wire is connected to the vehicle frame or metal parts that are fixed to the frame.
• If the wire is fixed with the bolt, the loop must be connected to the end of the wire.
• For better contact scrub paint from the place where loop is connected.

3.1. MODULE INSTALLATION

• Module should not be seen or easily reached.
• Module should be firmly fixed to the surface or cables.
• Module cannot be fixed to heat emitting or moving parts.
• SIM card should be inserted in the module while the connector is plugged off (while module has no power).
• Module must be fitted with double sided stick tape!

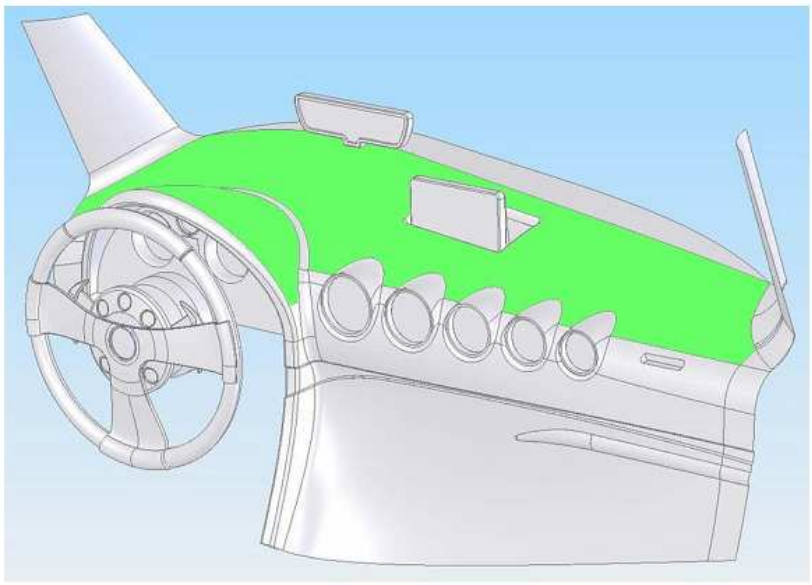


GPS antenna connection:

CORRECT

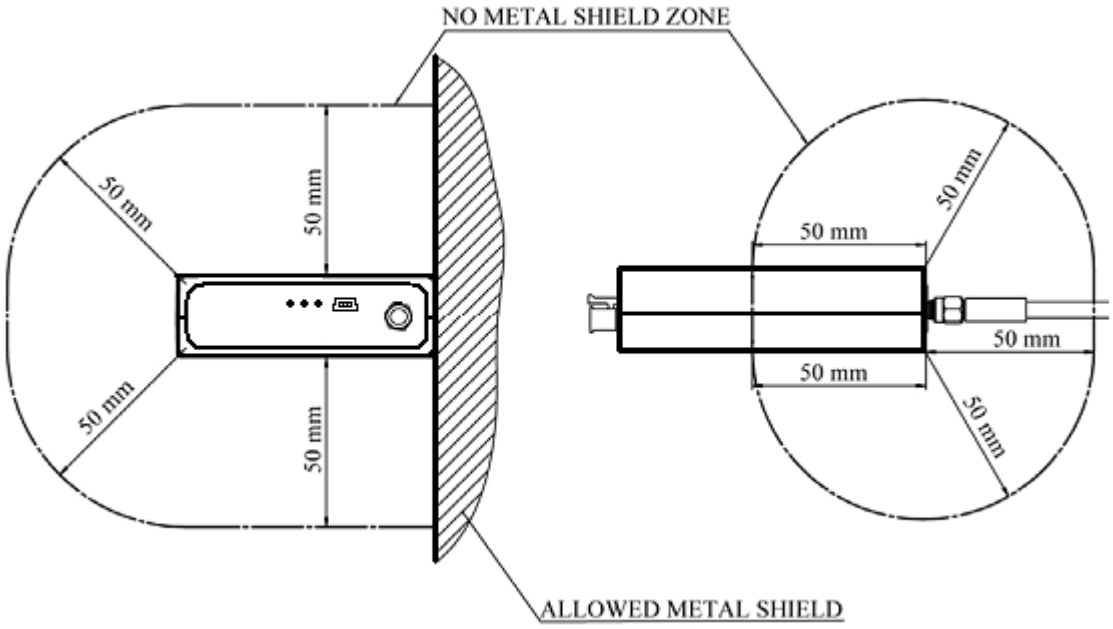
NOT CORRECT

It is recommended to place GPS antenna behind dashboard as close to the window as possible. A good example of GPS antenna placement is displayed in a picture below (area colored green).



PAY YOUR ATTENTION THAT FM-ECO3 TERMINAL HAS INTERNAL GSM ANTENNA!

To ensure good FM-Eco3 GPS and GSM connectivity it is strongly recommended to install not less than 50mm from any metal shield parts as it is shown in the picture below.



Installation near metal shield parts as shown in the picture below does not guarantee good GSM and GPS connectivity.