Ruptela
Transport Telematics

FM-Eco4 / 4+

Data Sheet v1.10

2016-04-08



- Small size: 82L x 63W x 28H (mm)
- IP67 certified
- 1-wire interface
- Low power consumption
- Internal power supply available (FM-Eco4+)

Physical properties

Dimensions	82L x 63W x 28H (mm)
Connector	12 pin
Indication	3 LEDs
Housing	Plastic
Protection	IP67

Product family

- **FM-Eco4/FM-Eco4+**
- FM-Eco4 light
- FM-Pro4
- FM-Tco4

Contacts

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Electrical specification

Power supply	
12/24 V DC (range: 10 - 32 V DC)	
Absolute maximum ratings (on FM-Eco4+)	50 V @ 60 s 72 V @ 0,1 s

Power consumption[1] @ 12 V	FM-Eco4	FM-Eco4+
Idle mode, mA	40	45
Sending records , mA	240	250
Deep sleep mode, mA	12	15
Internal power supply	-	LiPo 3,7 V 190 mAh

Storage	
Internal storage	4 MB (min. 30000 records)

Protections
Short circuit protection
Reverse polarity protection
Electrostatic discharge protection on USB
Electrostatic discharge protection on 1-wire data
Over-current protection on 1-Wire power
Electrostatic discharge protection on sim card slot
Charging protection[2] (on FM-Eco4+)

[1]Firmware dependent; given values are valid when there are no peripheral devices attached.
If battery is in charging mode, then power consumption in each mode will be higher within 100 mA.
[2] If temp is >45C, charging is disabled, if >60C battery is disconnected from the system at all.

I\O Characteristics

4 x DIN	Digital inputs
Threshold	4V
2 x DOUT	Digital outputs
Max. output	Open collector 32 V, 1 A max
2 x AIN	Analog inputs
Range	0 – 30 V
Resolution	12 bit
1 – Wire	1-Wire peripherals
5 V power output	80 mA @ 4,1 V
Mini USB	Configuration interface

Environmental data, reliability, certification

	FM-Eco4	FM-Eco4+
Storage temperature ºC	-40 - +65	-40 - +65
Operating temperature ºC	-35 - +60	-35 - +60
Operating from battery		
Charging ºC	×	0 - +45
Discharging ºC	×	-20 - +60
Altitude measurement range	Up to 3200 m	

Certification		
E mark	✓	✓
CE ready	✓	✓
RoHS	✓	✓
Temp. Test ISO 16750	✓	✓
IP67	✓	✓

Telecommunication, Positioning

GPS\GLONASS module	Ublox EVA-M8M
Internal	
72 channel	
Sensitivity	-163 dBm (GPS) -164 dBm (GLONASS&GPS)
Cold start	30 s
Aided start	3 s
GPS antenna	External
Frequency	1575,42 ± 3 MHz
GSM modem	Quectel M95
Internal	
GSM850\GSM900\DCS1800\PCS1900	
GSM antenna	Internal
GSM850\GSM900\DCS1800\PCS1900	
Accelerometer	3-axis; 2g/4g/8g/16g

Peripherals

Available on 1 - Wire
4 x Temperature sensors DS18B20/DS18S20
1 x iButton DS1990 with passive socket
Available on digital outputs
1 x Buzzer\LED
1 x Eco-Drive panel

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1	Red	Power supply 12/24 V, range: 10-32 V
2	Black	Ground
3	Purple	DOUT1
4	Orange	DOUT2
5	White with red stripe	1-Wire power
6	Green with yellow stripe	1-Wire data
7	Gray	AIN1
8	Green	AIN2
9	Yellow	DIN4
10	Pink	DIN1
11	White	DIN3
12	Blue	DIN2

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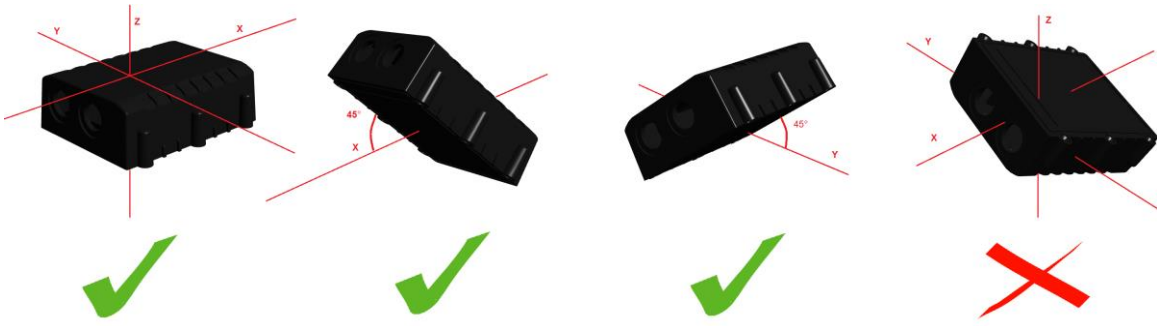
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Explanations

Deep sleep mode – Power saving mode when GNSS and GSM modules and all peripheral devices are disabled, except DINs and DOUTs. Device wake up on state change of any Digital Input (DIN).

Device can be installed within 45° angle in any axis but top surface facing up. Device should be installed tightly, does not move or shake.



Warning!

All internal components including battery must be replaced only by manufacturer! Any self-willed attempt to open device cases will void any warranty.

Device must be installed in service access area (e.g. under dashboard, behind fuse box).

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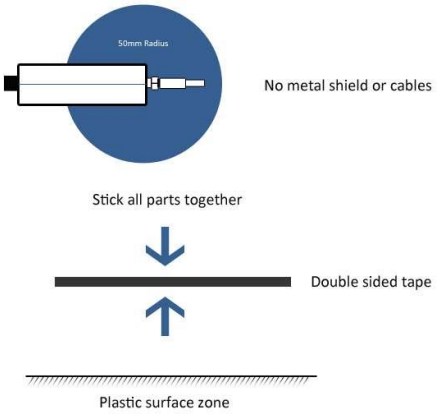
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Device installation

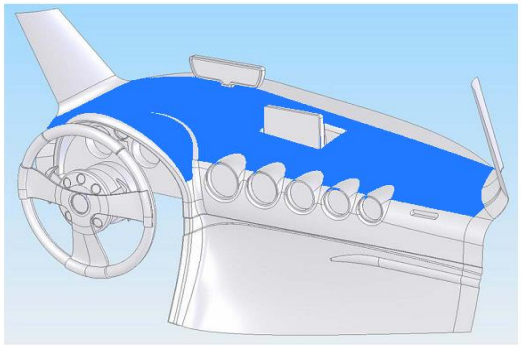
- When installing device into vehicle please obey these instructions otherwise your device may not work properly.
- Device should not be seen or easily reached.
- Device should be firmly fixed to the surface. Please avoid mounting it near the metal surface or cables (see the picture below).
- Wrong device mounting may cause malfunction.
- Device cannot be fixed to heat emitting or moving parts.
- SIM card should be inserted in the device while the connector is plugged off (while device has no power).
- Device must be fitted with double sided stick tape!

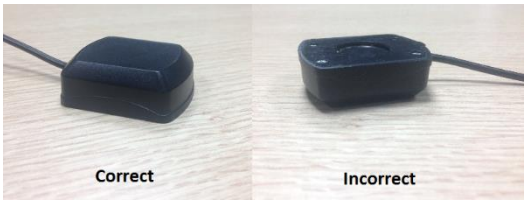


Antenna installation

It is recommended to place GPS/GLONASS antenna behind the dashboard as close to the window as possible. It must be uncovered, installed heads up (*see picture*).

Best place for GPS/GLONASS antenna is marked in blue (*see picture*).





Document application

Given parameter values and various characteristics contained within this document applies only to the most recent device hardware version.

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