

FM-Eco4 / 4+

Data Sheet v1.15

2017-10-11



- 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)
Weight	109g ± 10g
Connector	12 pin
Indication	3 LEDs
Housing	Plastic
Protection	IP67

Product family

- FM-Basic
- FM-Plug4 / 4+
- **FM-Eco4 / 4+**
- FM-Eco4 light / light+
- FM-Eco4 light 3G / light+ 3G
- FM-Pro4 / Pro4 3G / Pro4 BT
- FM-Tco4 LCV / LCV 3G / LCV BT
- FM-Tco4 HCV / HCV 3G / HCV BT

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 consumption¹ @ 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	x	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	
² Charging protection (on FM-Eco4+)	

¹Firmware 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, °C	-40 ~ +65	-40 ~ +65
Operating temperature, °C	-35 ~ +60	-35 ~ +60
Operating from battery		
Charging °C	x	0 - +45
Discharging °C	x	-20 - +60
Humidity range		
All cases	0 % ~ 95% Non-condensing	

Certification		
E mark	✓	✓
CE ready	✓	✓
RoHS	✓	✓
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; Up to 4g

Peripherals	
Available on 1 - Wire	
4 x Temperature sensors DS18B20/DS18S20	
1 x iButton DS1990, DS1971 with passive socket	
Available on digital outputs	
1 x Buzzer\LED	
1 x Eco-Drive panel	

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Pin out

Pin no	Wire color	Description
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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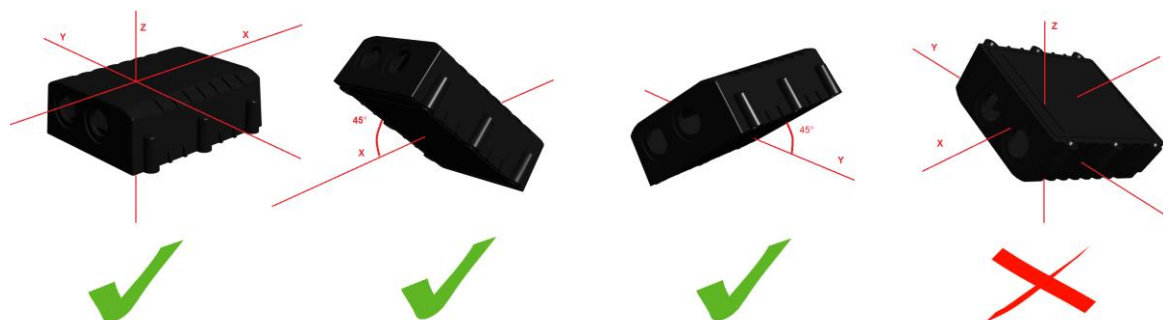
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Explanations

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 its top surface must be facing up. Device should be installed tightly, it should 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.



Caution! Devices are shipped to the users with partially charged batteries. After the first power up, the device must not be left to operate from the battery. It must be connected to an external power source, until the battery is fully charged. Once charging is complete, the device can begin its normal operation.



Caution! There is a risk of explosion if the battery is replaced by an incorrect type. Dispose used batteries according to the environmental requirements.



This crossed-out wheeled bin symbol means that waste equipment should not be disposed of with your other household waste. The product must be taken to separate collection points at the product's end-of life.

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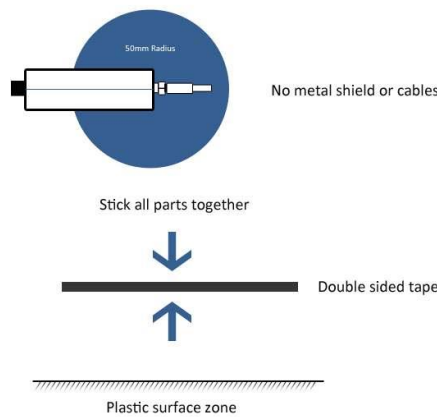
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Device installation

When installing device into vehicle please obey these instructions otherwise your device may not work properly.

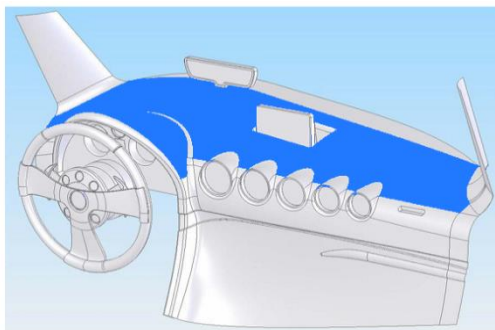
- Device should not be seen or easily reached. It must be installed in service access area (e.g. under dashboard, behind fuse box).
- Device should be firmly fixed to the surface. Please avoid mounting it near the metal surface or cables (see the picture below).
- Wrong device mounting may cause malfunction.
- 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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