

# FMM125 General description

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FMM125 is a tracking terminal with GNSS and GSM connectivity, which is able to collect device coordinates and transfer them via GSM network to a server. This device is perfectly suitable for applications, which require the location acquirement of remote objects.

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## Package contents

The FMM125 device is supplied to the customer in a cardboard box containing all the equipment that is necessary for operation. The package contains:

- FMM125 device;
- Input and output power supply cable with 2x6 connection pins;
- Micro USB cable;
- 3.7 V 170 mAh rechargeable Li-ion battery;

## Basic characteristics

GSM / GPRS / GNSS features:

- Quectel BG96 (LTE FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B26/B28 LTE TDD: B39 (for CAT M1 only)), TM2500 quad band module (GSM 850 / 900 / 1800 / 1900 MHz);
- Quectel BG95-M3 (LTE-FDD (CAT M1): B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/ B20/B25/B27/ B28/B66/B85 LTE-FDD (CAT NB2): B1/B2/B3/B4/B5/B8/ B12/B13/B18/B19/ B20/B25/B28/B39/B66/ B71/B85)., TM2500 quad band module (GSM 850 / 900 / 1800 / 1900 MHz);
- GPRS Multi-Slot class 12 (Up to 240 kbps);
- SMS (text, data);
- Integrated GNSS receiver;
- Up to -165 dBm GNSS receiver sensitivity.

Hardware features:

- Built-in movement sensor;

- Built-in Bluetooth 4.0 LE;
- Internal High Gain GNSS antenna;
- Internal High Gain GSM antenna;
- Internal flash memory 128MB (422 400 Records);
- 170 mAh Li-ion rechargeable 3.7 V battery.

Interface features:

- Power supply: +10... +30 V;
- 2 digital inputs;
- 1 analog input;
- 1 open collector digital output (connecting external relays, LED, buzzers etc);
- 1-Wire temperature sensor;
- 1-Wire iButton;
- LVCAN RX (INPUT 5);
- LVCAN TX (INPUT 6);
- 1 RS-232 interface;
- 1 RS-485 interface;
- 2 LEDs indicating device status.

Special features:

- Fast position fix;
- High Quality track even in high density urban canyon;
- Ultra small case;
- Ready for harsh environment;
- Easy to mount in limited access areas;
- Firmly fasten;
- 2 LED status indication;
- Real time tracking;
- Smart data acquisition based on:
  - Time;
  - Speed;
  - Angle;
  - Distance;
  - Ignition or any other I/O event;
- Sending acquired data via GPRS;
- GPRS and SMS I/O events;
- Virtual odometer;
- Configurable using Secured SMS Commands;
- 1x micro SIM card; 1x eSIM;
- Overvoltage protection;

<b>Description</b>	<b>Voltage</b>	<b>Duration</b>
Normal operation	+10 ... +30 V	Unlimited
Protection turns on, device turns off	34 V	Unlimited

Maximum voltage	< 70 V	Unlimited
Maximum voltage impulse	90 V	5 ms

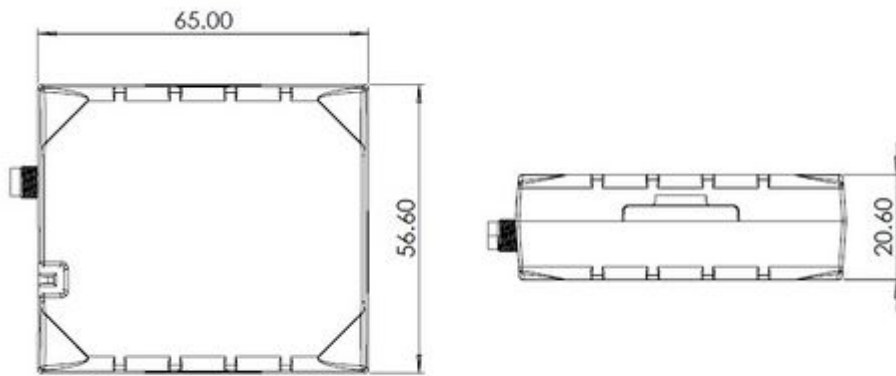
## Technical features

Part name	Physical specification
Navigation indication	LED
Modem indication	LED
Socket	Soldered inner socket
USB	Micro USB socket
GNSS	Internal GNSS antenna
GSM	Internal GSM antenna

### Technical details

2 W max. Current consumption at 12 V (Power supply 6...30 V DC)	GPRS: average 64.59 mA rms
	Nominal: average 37.77 rms
	GNSS sleep: average 11.1 mA
	Deep Sleep: average 6.2 mA
	Online Deep Sleep: average 6.5 mA
	Ultra deep sleep: average 3.4 mA
	Average 140 mA
Battery charge current	Average 140 mA
Operating temperature (without battery)	-20..+85 °C
Storage temperature (without battery)	-20..+85 °C
Storage relative humidity	5..95% (no condensation)
Device + case + battery weight	52 g

Dimension drawing:



## Technical information about internal battery

Internal back-up battery	Battery voltage (V)	Nominal capacity (mAh)	Power (Wh)	Charge temperature (°C)	Discharge temperature (°C)	Storage temperature (°C)
Li-ion rechargeable battery	3.75□3.90	170	0.64 - 0.66	0 to +45	-20 to +60	-20 to +45 for 1 month -20 to +35 for 6 months

Batteries are covered by 6 month [warranty](#) support.

- ✘ CAUTION: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

Battery should not be disposed of into general household waste.

- ✘ Bring damaged or worn-out batteries to your local recycling center or dispose them into a battery recycle bin commonly found in supermarkets.

## Electrical characteristics

Characteristic description	Value			Unit
	Min.	Typ.	Max.	
Supply Voltage:				
Supply Voltage (Recommended Operating Conditions)	+10		+30	V
Digital Output (Open Drain grade):				
Drain current (Digital Output OFF)			120	μA
Drain current (Digital Output ON, Recommended Operating Conditions)	0.1		0.5	A
Static Drain-Source resistance (Digital Output ON)		400	600	mΩ

#### Digital Input:

Input resistance (DIN1)	47		kΩ
Input resistance (DIN2)	51.7		kΩ
Input voltage (Recommended Operating Conditions)	0	Supply voltage	V
Input Voltage threshold (DIN1)	7.5		V
Input Voltage threshold (DIN2)	2.5		V

#### Analog Input:

Input voltage (Recommended Operating Conditions), Range 1	0	+10	V
Input resistance, Range 1	150		kΩ
Measurement error on 12V, Range 1	3		%
Additional error on 12 V, Range 1	360		mV
Measurement error on 30 V, Range 1	3		%
Additional error on 30 V, Range 1	900		mV
Input Voltage (Recommended Operating Conditions), Range 2	0	+30	V
Input resistance, Range 2	150		kΩ
Measurement error on 12V, Range 2	3		%
Additional error on 12 V, Range 2	360		mV
Measurement error on 30 V, Range 2	3		%
Additional error on 30 V, Range 2	900		mV
Output Supply Voltage 1-Wire:			
Supply voltage	+4.5	+4.7	V
Output inner resistance	7		Ω
Output current ( $U_{out} > 3.0$ V)	30		mA
Short circuit current ( $U_{out} = 0$ )	75		mA
RS232/RS485 Input Voltage:			
RS485 input voltage range on A or B pin (common-mode voltage)	-7	+12	V
RS232 input voltage range (common-mode voltage)	-15	+15	V

 **Analog Input error margin can increase if temperature varies.**

## Absolute maximum ratings

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Characteristic description	Value		
	Min.	Typ.	Max. Unit

Supply Voltage (Absolute Maximum Ratings)	-32	+32 V
Drain-Source clamp threshold voltage (Absolute Maximum Ratings), ( $I_{\text{drain}} = 2 \text{ mA}$ )		+36 V
Digital Input Voltage (Absolute Maximum Ratings)	-32	+32 V
Analog Input Voltage (Absolute Maximum Ratings)	-32	+32 V
RS232 Input Voltage (Absolute Maximum Ratings)	-25	+25 V