

# FMB140 General description

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FMB140 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 FMB140 device is supplied to the customer in a cardboard box containing all the equipment that is necessary for operation. The package contains:

- FMB140 device;
- Input and output power supply cable with 2x6 connection pins;
- 3.7 V 170 mAh rechargeable Li-ion battery.

## Basic characteristics

GSM / GPRS / GNSS features:

- Teltonika [TM2500](#) quad band module (GSM 850 / 900 / 1800 / 1900 MHz);
- GPRS Multi-Slot class 12 (Up to 85,6 kbps);
- SMS (text, data);
- Integrated GNSS receiver;
- Up to -165 dBm GNSS receiver sensitivity.

Hardware features:

- Built-in CAN data processor;
- 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 CAN lines;
- 1 digital inputs;
- 1 configurable input DIN2 with ground sense or AIN1;
- 1 configurable input DIN3 or AIN2;
- 2 open collector digital outputs (connecting external relays, LED, buzzers etc);
- 1-Wire temperature sensor;
- 1-Wire iButton;
- 3 LEDs indicating device status.

## Special features:

- Fast position fix (Outdoor areas);
- 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;
- 3 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;
- Jamming detection;
- 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

<b>Part name</b>	<b>Physical specification</b>
Navigation indication	LED
Modem indication	LED
CAN 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 73.6 mA
	Nominal: average 25.2 mA
	GNSS sleep: average 11.6 mA
	Deep Sleep: average 5.3 mA
	Online Deep Sleep: average 5.6 mA
Battery charge current	Ultra Deep Sleep: average 3.5 mA
	Average 140 mA
Operating temperature (without battery)	-40..+85 °C
Storage temperature (without battery)	-40..+85 °C
Storage relative humidity	5..95% (no condensation)
Device + case + battery weight	55 g

Dimension drawing:



## Technical information about internal battery

<b>Internal back-up battery</b>	<b>Battery voltage (V)</b>	<b>Nominal Capacity (mAh)</b>	<b>Power (Wh)</b>	<b>Charge temperature (°C)</b>	<b>Discharge temperature (°C)</b>	<b>Storage temperature (°C)</b>
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)	38.45			kΩ
Input resistance (DIN3)	47			kΩ
Input voltage (Recommended Operating Conditions)	0		Supply voltage	V
Input Voltage threshold (DIN1)		7.5		V
Input Voltage threshold (DIN2)		2.5		V
Input Voltage threshold (DIN3)		2.5		V
Analog Input:				
Input voltage (Recommended Operating Conditions), Range 1	0		+10	V
Input resistance, Range 1		38.45		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		38.45		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			$\Omega$
Output current ( $U_{out} > 3.0$ V)	30			mA
Short circuit current ( $U_{out} = 0$ )	75			mA
Ground sense:				
Input resistance	38.45			k $\Omega$
Input voltage (Recommended operating conditions)	0		Supply voltage	V
Input voltage threshold	0.5			V
Sink current		180		nA

CAN interface:

Internal terminal resistor CAN bus (no internal termination resistor)	-	-	-	$\Omega$
Differential input resistance	19	30	52	k $\Omega$
Recessive output voltage	2	2.5	3	V
Differential receiver threshold Voltage	0.5	0.7	0.9	V
Common mode input voltage	-30	-	30	V

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

## Absolute maximum ratings

Characteristic description	Value			Unit
	Min.	Typ.	Max.	
Supply Voltage (Absolute Maximum Ratings)	-32		+32	V
Drain-Source clamp threshold voltage (Absolute Maximum Ratings), ( $I_{drain} = 2$ mA)			+36	V
Digital Input Voltage (Absolute Maximum Ratings)	-32		+32	V
Analog Input Voltage (Absolute Maximum Ratings)	-32		+32	V