

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;

| Description | Voltage | Duration |
|---------------------------------------|----------------|-----------------|
| 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 |
| 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

| 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) | 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 | | | Ω |
| Output current ($U_{out} > 3.0$ V) | 30 | | | mA |
| Short circuit current ($U_{out} = 0$) | 75 | | | mA |
| Ground sense: | | | | |
| Input resistance | 38.45 | | | k Ω |
| 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) | - | - | - | Ω |
| Differential input resistance | 19 | 30 | 52 | k Ω |
| 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 |