# FMC250 General description



FMC250 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 FMC250 device is supplied to the customer in a cardboard box containing all the equipment that is necessary for operation. The package contains:

- FMC250 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:

- Name QJIB0: Quectel EG915U-EU with Teltonika TM2500, QKIB0: Quectel EG915U-LA with Teltonika TM2500;
- Technology LTE(CaT1)/2G(GSM/GPRS)/GNSS/BLUETOOTH;
- SMS (text, data);
- Integrated GNSS receiver;
- Up to -165 dBm GNSS receiver sensitivity.

CELLULAR:

| Technology | Supported bands |
|---|---|
| 2G bands | FMC150-QJIB0: GSM: B2/B3/B5/B8<br>FMC150-QKIB0: GSM: B2/B3/B5/B8 |
| 4G bands | FMC150-QJIB0: LTE FDD: B1/B3/B7/B8/B20/B28<br>FMC150-QKIB0: LTE FDD: B2/B3/B4/B5/B7/B8/B28/ B66 |

| | |
|---|---|
| Data transfer | LTE: LTE FDD: Max 10Mbps (DL)/Max 5Mbps (UL)<br>GSM: GPRS: Max 85.6Kbps (DL)/Max 85.6Kbps (UL) |

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;
- 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;
- Jamming detection;
- Configurable using Secured SMS Commands;

- Color ribbon non-detachable cable;
- 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.<br>Current consumption at 12 V (Power supply 6...30 V DC) | GPRS: average 73.6 mA<br>Nominal: average 25.2 mA<br>GNSS sleep: average 11.6 mA<br>Deep Sleep: average 5.3 mA<br>Online Deep Sleep: average 5.6 mA<br>Ultra Deep Sleep: average 3.5 mA |
| Battery charge current | 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<br>-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 | | | |
|---|---|---|---|---|
| | Min. | Typ. | Max. | Unit |
| 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 | | | kΩ |
| 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 | kΩ |
| 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 | | | |
|---|---|---|---|---|
| | Min. | **Typ.** | **Max.** | **Unit** |
| 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 |