

FMC13A General description

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FMC13A 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 FMC13A device is supplied to the customer in a cardboard box containing all the equipment that is necessary for operation. The package contains:

- FMC13A 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:

- FMC13A-QBIB0: Quectel EG91-NA with Teltonika TM2500;
- Technology LTE(CAT1)/UMTS/GNSS/BLUETOOTH
- SMS (text, data);
- Integrated GNSS receiver;
- Up to -165 dBm GNSS receiver sensitivity.

CELLULAR:

| Technology | Supported bands |
|---------------|--|
| 3G bands | WCDMA: B2/B4/B5 |
| 4G bands | LTE FDD: B2/B4/B5/B12/B13 |
| Data transfer | WCDMA: Max 384Kbps (DL)/Max 384 Kbps (UL) LTE FDD: Max 10Mbps (DL)/Max 5Mbps (UL) |

Transmit power:

Class 4 for GSM850/900: 23 ± 2 dBm

Class 1 for GSM1800/1900: 20 ± 2 dBm

Class 3 for LTE-TDD: 23 ± 2.7 dBm

Class 3 for LTE-FDD: 23 ± 2.7 dBm

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 (0.63 Wh).

Interface features:

- Power supply: +10...+30 V;
- 3 digital inputs;
- 1 negative inputs (DIN2);
- 2 impulse inputs (DIN1, DIN2);
- 2 analog input;
- 3 digital outputs (connecting external relays, LED, buzzers etc);
- 1-Wire temperature sensor;
- 1-Wire iButton;
- LVCAN RX (INPUT 5);
- LVCAN TX (INPUT 6);
- 2 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;

- 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 |
| Socket | Soldered inner socket |
| USB | Micro USB socket |
| GNSS | Internal GNSS antenna |
| GSM | Internal GSM antenna |

Technical details

| | |
|---|---|
| 2 W max. Current consumption (Power supply 10...30 V DC) | <ul style="list-style-type: none"> • At 12V < 3 mA (Ultra Deep Sleep) • At 12V < 5 mA (Deep Sleep) • At 12V < 16 mA (Online Deep Sleep) • At 12V < 18 mA (GPS Sleep) • At 12V < 33 mA (nominal with no load) • At 12V < 2A Max. (with full Load / Peak) |
| Battery charge current | Average 140 mA |
| Operating temperature (without battery) | -40..+85 °C |
| Storage temperature (without battery) | -20..+85 °C |
| Operating temperature (with battery) | -20..+40 °C |
| Storage temperature (with battery) | -20..+40 °C |
| Operating humidity | 5% to 95% non-condensing |
| Ingress Protection Rating | IP41 |

| | |
|--------------------------------|----------|
| Device + case + battery weight | 55 g |
| Internal fuse | 3A, 125V |

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) | 150 | | | 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 | | 0.9 | | % |
| Additional error on 12 V, Range 1 | | 108 | | mV |
| Measurement error on 30 V, Range 1 | | 0.33 | | % |
| Additional error on 30 V, Range 1 | | 88 | | mV |
| Input Voltage (Recommended Operating Conditions), Range 2 | 0 | | +30 | V |
| Input resistance, Range 2 | | 150 | | kΩ |
| Measurement error on 12V, Range 2 | | 0.9 | | % |
| Additional error on 12 V, Range 2 | | 108 | | mV |
| Measurement error on 30 V, Range 2 | | 0.33 | | % |
| Additional error on 30 V, Range 2 | | 88 | | 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.**