FMM920 General description

FMM920 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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Contents

Package contents

The FMM920 device is supplied to the customer in a cardboard box containing all the equipment that is necessary for operation. The package contains:

- Already implemented FMM920 device into case;
- Top and bottom device cover parts;
- 3.7 V 170 mAh rechargeable Li-ion battery;
- and output power supply cable with a 1x5 connection pins, which is already installed into device.

Basic characteristics

GSM / GPRS / GNSS features:

- Quectel BG95-M3, Teltonika TM2500
- SMS (text, data);
- Technology LTE CAT M1/NB-IoT/GSM/GPRS/GNSS/BLUETOOTH;
- Integrated GNSS receiver;
- Up to -165 dBm GNSS receiver sensitivity.

CELLULAR:

Technology	Supported bands
2G bands	BG95-M3: B2/B3/B5/B8

4G bands	BG95-M3: LTE-FDD (CAT M1): B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85 LTE-FDD (CAT NB2): B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85 GSM: 850/900/1800/1900
Data transfer	LTE: Max. 588Kbps (DL)/Max.1119Kbps (UL) GPRS: Max. 107Kbps (DL)/Max. 85.6Kbps (UL)

Transmit power:

Class 4 for GSM850/900: 23±2dBm

Class 1 for GSM1800/1900: 20±2dBm

Class 3 for LTE-TDD: 23±2.7dBm

Class 3 for LTE-FDD: 23±2.7dBm

Hardware features:

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

Interface features:

- Power supply: +10... +30 V;
- 1 digital input;
- 1 analog input;
- 1 open collector digital output (connecting external relays, LED, buzzers etc);
- 2 LEDs indicating device status.

Special features:

- Fast position fix;
- High Quality track even in high density urban canyon;
- Small case;
- Ready for harsh environment;
- Easy to mount in limited access areas;
- Firmly fasten;
- 1 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;

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

Technical details	
2 W max. Current consumption at 12 V (Power supply 10...30 V DC)	Nominal: <28 mA GNSS sleep: <12 mA Deep Sleep: <3 mA Online Deep Sleep: 8 mA Ultra Deep Sleep: 2 mA
Battery charge current	Average: 140 mA
Operating temperature (with battery)	-20 ... +40 °C
Operating temperature (without battery)	-40 ... +85 °C
Storage temperature (without battery)	-40 ... +85 °C
Storage relative humidity	5 ... 95% (no condensation)
Device + case weight + battery weight	54 g

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			
	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
Digital Input:			300	mΩ
Digital Output (Open Drain grade):				
Input resistance (DIN1)	47			kΩ
Input voltage (Recommended Operating Conditions)	0		Supply voltage	V
Input Voltage threshold (DIN1)		4		V
Analog Input:				
Input voltage (Recommended Operating Conditions)	0		30	V
Input resistance		150		kΩ
Measurement error on 12 V		3		%
Additional error on 12 V		360		mV
Measurement error on 30 V		3		%
Additional error on 30 V		900		mV

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