FMB640 General description

FMB640 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

Usually the FMB640 device sample is supplied to the customer in a cardboard box containing all the equipment that is necessary for operation. The package contains:

- FMB640 device;
- 4 screws for assembling device
- GPS/GLONASS antenna
- GSM antenna
- USB cable
- Port 1/2 cable
- Port 3 cable
- Ni-MH Rechargeable battery, 8.4V, 550 mA.
- Input and output power supply cable with 2x10 connection pins.

Basic characteristics

Cellular:

- GSM/GPRS technology
- 2G bands: Quad-band 800/850/900/1900 MHz
- GPRS Mobile Station Class B
- GPRS Multi-Slot class 12 (up to 240 kbps)
- SMS (text, data)

GNSS features:

- Tracking: 33/ 99 acquisition channels
- -165 dBM sensitivity
- Hot start <1s
- Warm Start < 25s
- Cold start < 35s
- NMEA-183 protocol
- GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS, DGPS, AGPS
- Accuracy < 3m

Hardware features:

- STM32 processor;
- 2 MB internal Flash memory;
- External memory card slot;
- Built-in accelerometer;
- Ni-Mh 550 mAh internal battery;

Interface features:

- Power supply: +10...+30 V;
- Integrated KLINE
- Dual CAN J1939
- J1708 CAN
- RS485 and 2x RS232 support
- 4 Digital Inputs for object status monitoring
- 4 Digital Open-collector Outputs (controlling external relays, LED, buzzers, etc.)
- 4 Analog Inputs
- 1-wire interface
- MicroSD card
- 2 status LED
- Dimensions: L(104,1mm)xW(76,8mm)xH(31,5mm)
- Configuration and firmware update (via FOTA and USB cable)
- External GSM antenna for higher sensitivity
- External GNSS antenna for higher sensitivity

Special features:

- Fast position fix;
- 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;
- Reverse polarity 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	Mini USB socket
GNSS	External GNSS antenna
GSM	External GSM antenna

Technical details	
2 W max. Current consumption at 12 V	GPRS: average 67 mA rms Nominal: average 39 rms GNSS sleep: average 24 mA Deep Sleep: average 7,5 mA Online Deep Sleep: average 2,4 mA

2 W max. Current consumption at 24 V	GPRS: average 35 mA Nominal: average 20 mA GNSS sleep: average 12,5 mA Deep Sleep: average 3,8 mA Online Deep Sleep: average 1,3 mA
Battery charge current	Average 55 mA
Operating temperature (without battery)	-40..+85
Storage temperature (without battery)	-40..+85
Storage relative humidity	5..95% (no condensation)
Device + case + battery weight	197 g

Dimension drawing:

Technical information about internal battery

Internal back-up battery	Battery voltage (V)	Nominal Capacity (mAh)	Charging temperature (°C)
Ni-MH rechargeable battery	8.4□10.0	550	0 – 45

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.

Battery tests

The amount of time the device will work from internal battery depends on the battery health, how often the device saves/sends information to the server, external peripherals connected to the device and the results may also differ depending on firmware used.

For general comparison purpose, and to see what results can be achieved, you can refer to the following internal test results in different modes and sending frequencies:

Mode:	Min Period (data saving frequency)	Send Period (data sending frequency)	Starting Voltage	Cut off Voltage	Time achieved
Operating	10 seconds	60 seconds	10,1V	8,3V	471 min (7 hours 51 minutes)
Operating	60 seconds	60 seconds	10,2V	8,3V	546 min (9 hours 16 minutes)

Deep Sleep	12 hours	12 hours	10,0V	8,2V	15120 min (252 hours 0 minutes)
Online Deep Sleep	12 hours	12 hours	10,2V	8,6V	6480 min (108 hours 0 minutes)

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)			0.5	A
Static Drain-Source resistance (Digital Output ON)		400	300	mΩ
Digital Input:				
Input resistance (DIN1)	15			kΩ
Input resistance (DIN2)	15			kΩ
Input resistance (DIN3)	15			kΩ
Input voltage (Recommended Operating Conditions)	0		Supply voltage	V
Input Voltage threshold (DIN1)		7.5		V
Input Voltage threshold (DIN2, DIN3, DIN4)		2.5		V
Analog Input:				
Input voltage (Recommended Operating Conditions), Range 1	0		+10	V
Input resistance, Range 1		120		kΩ
Input voltage (Recommended Operating Conditions), Range 2	0		+30	V
Input resistance, Range 2		147		kΩ
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
CAN Interface:				

Internal terminal resistors CAN bus		120		Ω
Differential input resistance	19	30	52	kΩ
Recessive output voltage	2	2.5	3	V
Differential input resistance	0.5	0.7	0.9	V
Common mode input voltage	-30		30	V
Power supply current (Hardware version with internal battery):				
Deep Sleep, average, Icc.ds		2.5	4	mA
Sleep, average, Icc.ds, Vcc=10V		45		mA
Sleep, average, Icc.ds, Vcc=30V		25		mA
Ucc=12.6V, all modules fully working, internal battery is charging, Icc1			350	mA
Ucc=12.6V, all modules fully working, internal battery is charging, Icc2			300	mA
Ucc=25.2V, all modules fully working, internal battery is charging, Icc3			195	mA
Ucc=25.2V, all modules fully working, internal battery is charging, Icc4			140	mA
RS232/RS485 Input Voltage:				
RS485 input voltage range on A or B pin (common-mode voltage)	-7		+12	V
RS232 input voltage range (common-mode voltage)	-15		+15	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
RS232 Input Voltage (Absolute Maximum Ratings)	-25		+25	V