TELTONIKA | Telematics

FMC125

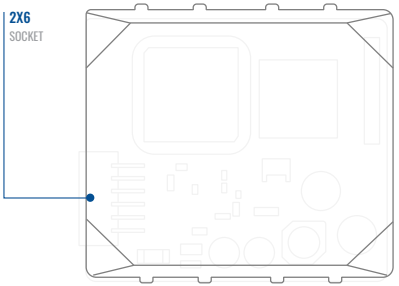
Professional LTE terminal with GNSS and LTE/GSM connectivity, RS485/ RS232 interfaces and backup battery

Quick Manual v2.6

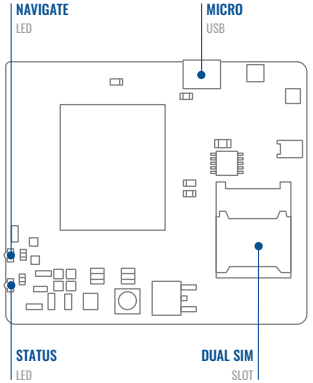
CONTENT

KNOW YOUR DEVICE

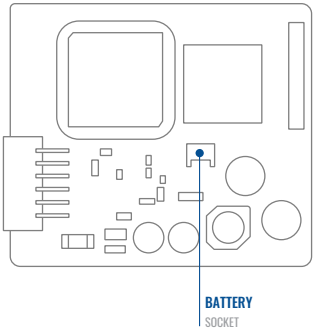
TOP VIEW



BOTTOM VIEW (WITHOUT COVER)



TOP VIEW (WITHOUT COVER)

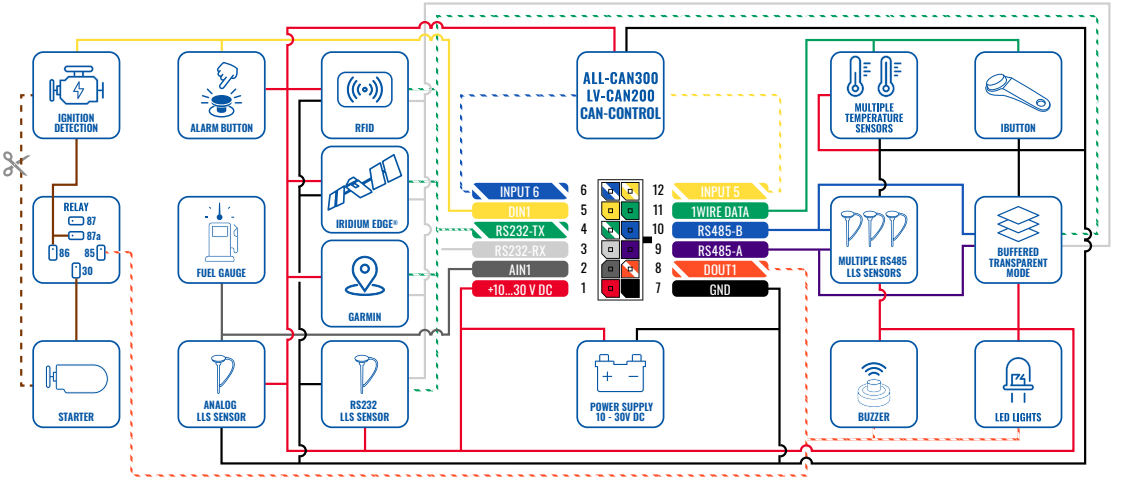


PINOUT

PIN NUMBER	PIN NAME	DESCRIPTION
1	VCC (10-30)V DC (+)	Power supply (+10-30 V DC).
2	AIN 1/DIN 2	Analog input, channel 1. Input range: 0-30 V DC / Digital input, channel 2.
3	RS232 – RX	Input for data receive through RS232
4	RS232 – TX	Output for data transmit through RS232
5	DIN 1	Digital input, channel 1.
6	INPUT 6	TX EXT (LVCAN – TX).
7	GND (-)	Ground pin. (10-30) V DC
8	DOUT 1	Digital output, channel 1. Open collector output. Max. 0,5 A DC.
9	RS485 – A	Signal A wire for RS485
10	RS485 – B	Signal B wire for RS485
11	1WIRE DATA	Data for 1–Wire devices.
12	INPUT 5	RX EXT (LVCAN - RX).

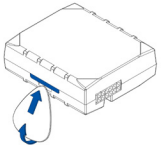
FMC125 2x6 socket pinout

WIRING SCHEME



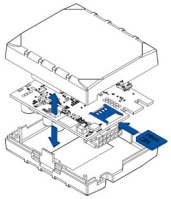
SET UP YOUR DEVICE

HOW TO INSERT MICRO-SIM CARD AND CONNECT THE BATTERY



1 COVER REMOVAL

Gently remove FMC125 **cover** using **plastic pry tool** from both sides.

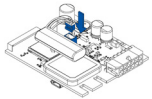


2 MICRO-SIM CARD INSERT

Insert **SIM** card as shown with **PIN request disabled** or read our **Wiki**[1] how to enter it later in **Teltonika Configurator**[2]. Make sure that SIM card **cut-off corner** is pointing outward from slot. **SIM slot 1** is closer to PCB, **SIM slot 2** is the top one.

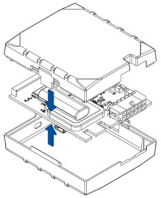
[1] wiki.teltonika-gps.com/view/FMC125_Security_info

[2] wiki.teltonika-gps.com/view/Teltonika_Configurator



3 BATTERY CONNECTION

Connect **battery** as shown to device. Position the battery in place where it does not obstruct other components.



4 ATTACHING COVER BACK

After **configuration**, see "**PC Connection (Windows)**[1]", attach device **cover** back.

[1] Page 7, "PC Connection (Windows)"

PC CONNECTION (WINDOWS)

1. Power-up FMC125 with **DC voltage (10 – 30 V)** power supply using **supplied power cable**. LED's should start blinking, see **"LED indications[1]"**.
2. Connect device to computer using **Micro-USB cable** or Bluetooth® connection:
   - Using Micro-USB cable
     - You will need to install USB drivers, see **"How to install USB drivers (Windows)[2]"**
   - Using **Bluetooth® wireless technology**
     - FMC125 **Bluetooth® technology** is enabled by default. Turn on Bluetooth® connection on your PC, then select **Add Bluetooth or other device > Bluetooth.** Choose your device named – **"FMC125_last_7_imei_digits"**, without **LE** in the end. Enter default password **5555**, press **Connect** and then select **Done**.
3. You are now ready to use the device on your computer.

[1] wiki.teltonika-gps.com/view/FMC125_LED_status

[2] Page 6, "How to install USB drivers"

HOW TO INSTALL USB DRIVERS (WINDOWS)

1. Please download COM port drivers from [1].
2. Extract and run .
3. Click in driver installation window.
4. In the following window click button.
5. Setup will continue installing the driver and eventually the confirmation window will appear. Click to complete the setup.

teltonika.lt/downloads/en/FMC125/TeltonikaCOMDriver.zip

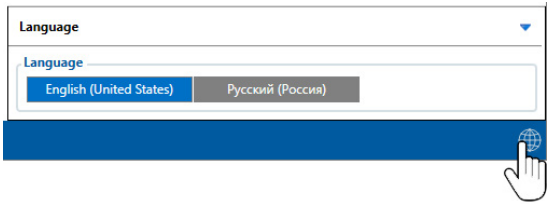
CONFIGURATION

At first FMC125 device will have default factory settings set. These settings should be changed according to the users needs. Main configuration can be performed via **Teltonika Configurator** software. Get the latest **Configurator** version from **here**. Configurator operates on **Microsoft Windows OS** and uses prerequisite **MS .NET Framework.** Make sure you have the correct version installed.

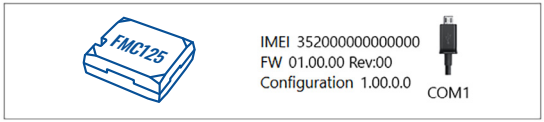
MS .NET REQUIREMENTS

Operating system	MS .NET Framework version	Version	Links
Windows Vista Windows 7 Windows 8.1 Windows 10	MS .NET Framework 4.6.2	32 and 64 bit	**www.microsoft.com**[1]

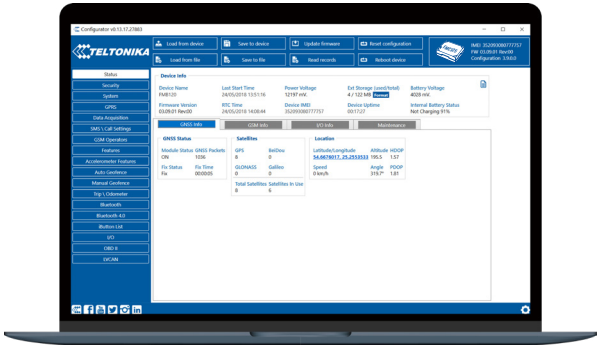
1 dotnet.microsoft.com/en-us/download/dotnet-framework/net462



Downloaded Configurator will be in compressed archive. Extract it and launch Configurator.exe. After launch software language can be changed by clicking in the right bottom corner.



Configuration process begins by pressing on connected device.



After connection to Configurator **Status window** will be displayed.

Various **Status window**[1] tabs display information about **GNSS**[2], **GSM**[3], **I/O**[4], **Maintenance**[5] and etc. FMC125 has one user editable profile, which can be loaded and saved to the device. After any modification of configuration the changes need to be saved to device using **Save to device** button. Main buttons offer following functionality:

Load from device – loads configuration from device.

Save to device – saves configuration to device.

Load from file – loads configuration from file.

Save to file – saves configuration to file.

Update firmware – updates firmware on device.

Read records – reads records from the device.

Reboot device – restarts device.

Reset configuration – sets device configuration to default.

Most important configurator section is **GPRS** – where all your server and **GPRS settings**[6] can be configured and **Data Acquisition**[7] – where data acquiring parameters can be configured. More details about FMC125 configuration using Configurator can be found in our **Wiki**[8].

[1] wiki.teltonika-gps.com/view/FMC125_Status_info

[2] wiki.teltonika-gps.com/view/FMC125_Status_info#GNSS_Info

[3] wiki.teltonika-gps.com/view/FMC125_Status_info#GSM_Info

[4] wiki.teltonika-gps.com/view/FMC125_Status_info#I.2FO_Info

[5] wiki.teltonika-gps.com/view/FMC125_Status_info#Maintenance

[6] wiki.teltonika-gps.com/index.php?title=FMC125_GPRS_settings

[7] wiki.teltonika-gps.com/index.php?title=FMC125_Data_acquisition_settings

[8] wiki.teltonika-gps.com/index.php?title=FMC125_Configuration

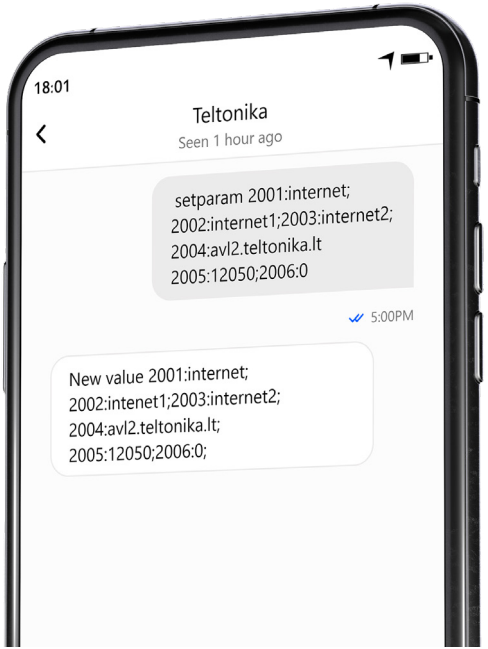
QUICK SMS CONFIGURATION

Default configuration has optimal parameters present to ensure best performance of track quality and data usage.

Quickly set up your device by sending this SMS command to it:

```
«  setparam 2001:APN;2002:APN_username;2003:APN_password;2004:Domain;2005:Port;2006:0»
```

Note: Before SMS text, two space symbols should be inserted.



GPRS SETTINGS:

1. **2001** – APN
2. **2002** – APN username (if there are no APN username, empty field should be left)
3. **2003** – APN password (if there are no APN password, empty field should be left)

SERVER SETTINGS:

4. **2004** – Domain
5. **2005** – Port
6. **2006** – Data sending protocol (0 – TCP, 1 – UDP)

DEFAULT CONFIGURATION SETTINGS

MOVEMENT AND IGNITION DETECTION:

VEHICLE MOVEMENT
will be detected by accelerometer

IGNITION
will be detected by vehicle power voltage between 13,2 – 30 V

DEVICE MAKES A RECORD ON STOP IF:

1 HOUR PASSES
while vehicle is stationary and ignition is off

RECORDS SENDING TO SERVER:

EVERY 120 SECOND
it is sent to the server If device has made a record

DEVICE MAKES A RECORD ON MOVING IF ONE OF THESE EVENTS HAPPEN:

PASSES
300 seconds

VEHICLE DRIVES
100 meters

VEHICLE TURNS
10 degrees

SPEED DIFFERENCE
between last coordinate and current position is greater than 10 km/h

After successful SMS configuration, FMC125 device will synchronize time and update records to configured server. Time intervals and default I/O elements can be changed by using **Teltonika Configurator**[1] or **SMS parameters**[2].

[1] wiki.teltonika-gps.com/view/Teltonika_Configurator

[2] wiki.teltonika-gps.com/view/Template:FMB_Device_Family_Parameter_list

MOUNTING RECOMMENDATIONS

CONNECTING WIRES

- Wires should be fastened to the other wires or non-moving parts. Try to avoid heat emitting and moving objects near the wires.
- The connections should not be seen very clearly. If factory isolation was removed while connecting wires, it should be applied again.
- If the wires are placed in the exterior or in places where they can be damaged or exposed to heat, humidity, dirt, etc., additional isolation should be applied.
- Wires cannot be connected to the board computers or control units.

CONNECTING POWER SOURCE

- Be sure that after the car computer falls asleep, power is still available on chosen wire. Depending on car, this may happen in 5 to 30 minutes period.
- When module is connected, measure voltage again to make sure it did not decrease.
- It is recommended to connect to the main power cable in the fuse box.
- Use 3A, 125V external fuse.

CONNECTING IGNITION WIRE

- Be sure to check if it is a real ignition wire i. e. power does not disappear after starting the engine.
- Check if this is not an ACC wire (when key is in the first position, most of the vehicle electronics are available).
- Check if power is still available when you turn off any of vehicles devices.
- Ignition is connected to the ignition relay output. As alternative, any other relay, which has power output when ignition is on, may be chosen.

CONNECTING GROUND WIRE

- Ground wire is connected to the vehicle frame or metal parts that are fixed to the frame.
- If the wire is fixed with the bolt, the loop must be connected to the end of the wire.
- For better contact scrub paint from the spot where loop is going to be connected.

LED INDICATIONS

NAVIGATION LED INDICATIONS

BEHAVIOUR	MEANING
Permanently switched on	GNSS signal is not received
Blinking every second	Normal mode, GNSS is working
Off	GNSS is turned off because: Device is not working or Device is in sleep mode
Blinking fast constantly	Device firmware is being flashed

STATUS LED INDICATIONS

BEHAVIOUR	MEANING
Blinking every second	Normal mode
Blinking every two seconds	Sleep mode
Blinking fast for a short time	Modem activity
Off	Device is not working or Device is in boot mode

BASIC CHARACTERISTICS

MODULE	
Name	FMC125-MBIB0: MeiG SLM320-E with Teltonika TM2500 FMC125-MCIB0: MeiG SLM320-LA with Teltonika TM2500
Technology	LTE(CaT1)/2G(GSM/GPRS)/GNSS/ BLUETOOTH® LE

GNSS	
GNSS	GPS, GLONASS, GALILEO, BEIDOU, QZSS, AGPS
Receiver	Tracking: 33
Tracking sensitivity	-165 dBM
Position accuracy	< 2.5 CEP
Velocity accuracy	< 0.1m/s (within +/- 15% error)
Hot start	< 1 s
Warm start	< 25 s
Cold start	< 35 s
Technology	Quectel EC21-EC:LTE Cat 1, UMTS, GSM
2G bands	FMC125-MBIB0: GSM: B2/B3/B5/B8 FMC125-MCIB0: GSM: B2/B3/B5/B8

4G bands	FMC125-MBIB0: LTE FDD: B1/B3/B7/B8/B20/B28 LTE-TDD:B38/B40/B41 FMC125-MCIB0: LTE FDD: B1/B2/B3/B4/B5/B7/B8/B20/B28 LTE-TDD:B40
Data transfer	LTE: LTE FDD: Max 10Mbps (DL)/ Max 5Mbps (UL) LTE TDD: Max 8Mbps (DL)/Max 2Mbps (UL) GSM: GPRS: Max 85.6Kbps (DL)/Max 85.6Kbps (UL)
Data support	SMS (text/data)

POWER

Input voltage range	10 – 30 V DC with overvoltage protection
Back-up battery	170 mAh Li-Ion battery 3.7 V (0.63 Wh)
Internal Fuse	3 A, 125 V
Power consumption	At 12V < 4 mA (**Ultra Deep Sleep**[1]) At 12V < 6 mA (**Deep Sleep**[1]) At 12V < 12 mA (**Online Deep Sleep**[1]) At 12V < 19 mA (**GPS Sleep**[1]) At 12V < 36 mA (nominal with no load) At 12V < 1A Max. (with full Load / Peak)

BLUETOOTH® TECHNOLOGY

Specification	4.0 + LE
Supported peripherals	**Temperature and Humidity sensor**[2], **Headset**[3], **OBDII dongle**[4], Inateck Barcode Scanner, Bluetooth® LE sensors support

INTERFACE

Digital Inputs	2
Digital Outputs	1
Analog Inputs	1
CAN Adapter inputs	1

[1] wiki.teltonika-gps.com/view/FMC125_Sleep_modes

[2] teltonika-gps.com/products/accessories

[3] wiki.teltonika-gps.com/view/How_to_connect_Bluetooth_Hands_Free_adapter_to_FMB_device

[4] wiki.teltonika-gps.com/view/How_to_connect_OBD_II_Bluetooth_Dongle_to_FMB_device

1-Wire	1
RS232	1
RS485	1
GNSS antenna	Internal High Gain
Cellular antenna	Internal High Gain
USB	2.0 Micro-USB
LED indication	2 status LED lights
SIM	2x SIM Card (Dual-SIM)
Memory	128MB internal flash memory

PHYSICAL SPECIFICATION

Dimensions	65 x 56,6 x 20,6 mm (L x W x H)
Weight	55 g

OPERATING ENVIRONMENT

Operating temperature (without battery)	-20 °C to +85 °C
Storage temperature (without battery)	-20 °C to +85 °C
Operating temperature (with battery)	-20 °C to +40 °C
Storage temperature (with battery)	-20 °C to +45 °C
Operating humidity	5% to 95% non-condensing
Ingress Protection Rating	IP41
Battery charge temperature	0 °C to +45 °C
Battery discharge temperature	-20 °C to +60 °C
Battery storage temperature	-20 °C to +45 °C for 1 month -20 °C to +35 °C for 6 months

FEATURES

Sensors	Accelerometer
Scenarios	**Green Driving**, **Over Speeding detection**, **GNSS Fuel Counter**, **DOUT Control Via Call**, Excessive Idling detection, **Immobilizer**, **iButton Read Notification**, Unplug detection, Towing detection, Crash detection, Auto Geofence, Manual Geofence, Trip[5]
Sleep modes	**GPS Sleep**, **Online Deep Sleep**, **Deep Sleep**, **Ultra Deep Sleep**[6]

[5] wiki.teltonika-gps.com/view/FMC125_Features_settings

[6] wiki.teltonika-gps.com/view/FMC125_Sleep_modes

Configuration and firmware update	**FOTA Web**[7], FOTA, **Teltonika Configurator**[8] (USB, Bluetooth® wireless technology), FMBT mobile application (Configuration)
SMS	Configuration, Events, DOUT control, Debug
GPRS commands	Configuration, DOUT control, Debug
Time Synchronization	GPS, NITZ, NTP
Fuel monitoring	LLS (Analog), **LV-CAN200**[9], **ALL-CAN300**[10], **OBDII dongle**[11], RS232/ RS485 fuel sensor, **CAN-CONTROL**[12]
Ignition detection	Digital Input 1, Accelerometer, External Power Voltage, Engine RPM (CAN Adapters, OBDII dongle)
RS232	Log Mode, NMEA, LLS, LCD, RFIH HID/MF7, Garmin FMI, TCP SCII/ Binary
RS485	Log Mode, NMEA, LLS, TCP SCII/ Binary

[7] wiki.teltonika-gps.com/view/FOTA_WEB

[8] wiki.teltonika-gps.com/view/Teltonika_Configurator

[9] teltonika-gps.com/products/trackers/can-obd-data/lv-can200

[10] teltonika-gps.com/products/trackers/can-obd-data/all-can300

[11] wiki.teltonika-gps.com/view/How_to_connect_OBD_II_Bluetooth_Dongle_to_FMB_device

[12] teltonika-gps.com/products/trackers/can-obd-data/can-control

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)	39			kΩ

CHARACTERISTIC DESCRIPTION	VALUE			
	MIN.	TYP.	MAX.	UNIT
Input voltage (Recommended Operating Conditions)	0		30	V
Input Voltage threshold (DIN1)		7.5		V
Input Voltage threshold (DIN2)		2.5		V

ANALOG INPUT

Input voltage (Recommended Operating Conditions), Range 1	0		+10	V
Input resistance, Range 1		150		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

CHARACTERISTIC DESCRIPTION	VALUE			
	MIN.	TYP.	MAX.	UNIT
Input Voltage (Recommended Operating Conditions), Range 2	0		+30	V
Input resistance, Range 2		150		kΩ
Measurement error on 12 V, 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 (Uout > 3.0 V)		30		mA
Short circuit current (Uout = 0)		75		mA

SAFETY INFORMATION

This message contains information on how to operate FMC125 safely. By following these requirements and recommendations, you will avoid dangerous situations. You must read these instructions carefully and follow them strictly before operating the device!

- The device uses SELV limited power source. The nominal voltage is +12 V DC. The allowed voltage range is +10...+30 V DC.
- To avoid mechanical damage, it is advised to transport the device in an impact-proof package. Before usage, the device should be placed so that its LED indicators are visible. They show the status of device operation.
- When connecting the 2x6 connector wires to the vehicle, the appropriate jumpers of the vehicle power supply should be disconnected.
- Before unmounting the device from the vehicle, the 2x6 connector must be disconnected. The device is designed to be mounted in a zone of limited access, which is inaccessible to the operator. All related devices must meet the requirements of EN 62368-1 standard.
- The device FMC125 is not designed as a navigational device for boats.

Do not disassemble the device. If the device is damaged, the power supply cables are not isolated or the isolation is damaged, DO NOT touch the device before unplugging the power supply.

All wireless data transferring devices produce interference that may affect other devices which are placed nearby.

The device must be connected only by qualified personnel.

The device must be firmly fastened in a predefined location.

The programming must be performed using a PC with autonomic power supply.

Installation and/or handling during a lightning storm is prohibited.

The device is susceptible to water and humidity.

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 with general household waste. Bring damaged or worn-out batteries to your local recycling center or dispose them to battery recycle bin found in stores.

CERTIFICATION AND APPROVALS

This sign on the package means that it is necessary to read the User's Manual before your start using the device. Full User's Manual version can be found in our **Wiki**[1].

1 wiki.teltonika-gps.com/index.php?title=FMB920

Hereby, Teltonika declare under our sole responsibility that the above described product is in conformity with the relevant Community harmonization: European Directive 2014/53/EU (RED).

The Declaration EAC and the Certificate EAC in conformity with the technical regulation TR CU of the EurAsEC Customs Union are EAC certification documents issued by independent organizations. Such organizations perform their function through laboratories accredited to the public agencies in charge of the supervision of metrology and standardization in the three countries of the EAC Custom Union, joining at the moment the certification system : Russia, Belarus, Kazakhstan, Armenia and Kyrgyzstan.

REACH addresses the production and use of chemical substances, and their potential impacts on both human health and the environment. Its 849 pages took seven years to pass, and it has been described as the most complex legislation in the Union's history and the most important in 20 years. It is the strictest law to date regulating chemical substances and will affect industries throughout the world.

The RoHS1 is a directive regulating the manufacture, import and distribution of Electronics and Electrical Equipment (EEE) within the EU, which bans from use 10 different hazardous materials (to date).

This sign on the package means that all used electronic and electric equipment should not be mixed with general household waste.

E-Mark and e-Mark are the European conformity marks issued by the transport sector, indicating that the products comply with relevant laws and regulations or directives. Vehicles and related products need to go through the E-Mark certification process to be legally sold in Europe.

The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by UAB Teltonika Telematics is under license. Other trademarks and trade names are those of their respective owners.

CITC mandates that network-based devices must support 4G/LTE technology as a prerequisite for approval of such equipment in Saudi Arabia. Hence, 2G and 3G only devices can no longer be approved and certified in the Kingdom.

The Australian Standard AS/NZS 4417.1 and AS/NZS 4417.2 Marking of electrical products to indicate compliance with regulations – General rules for use of the mark provides general requirements for the use of the RCM including location of the marking on the equipment and its dimensional requirements.

SIRIM QAS International Sdn. Bhd. is Malaysia's leading testing,inspection and certification body.

Para maiores informações, consulte o site da ANATEL www.anatel.gov.br
Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.

For more information, see the ANATEL website www.anatel.gov.br
This equipment is not entitled to protection against harmful interference and must not cause interference in duly authorized systems.

TELEC certification complies with the Radio Law of Japan, and the specific test specifications are in compliance with MIC (Ministry of Internal Affairs and Communications) Notice No. 88 regulations. According to the requirements of the Japanese Radio Law, the production, sale, and operation of wireless equipment in Japan must comply with the technical regulations approved by the MIC, and it is mandatory to apply for a type approval certificate for radio equipment (ie, TELEC certification).

The primary function of the TRC is to regulate the telecommunications and information technology (ICT) service sectors, as well as the postal sector according to the Postal Law No 34 of 2007.

JATE certification is a telecommunications equipment compliance certification. This certification is for communications equipment in Japan, ensuring that the equipment meets the Japanese "Electric Communications Business Law". All wireless products connected to public phones or telecommunications networks must apply for JATE certification. In simple terms, JATE certification is a Japanese access certification.

TRA stands for Telecommunication Regulatory Authority. Its main task is to approve radio technology products for UAE (United Arab Emirates). Manufactures in respective fields distribute products.

The Security Industry Regulatory Agency (SIRA) is an agency within the Government of Dubai that protects lives and properties by suggesting new laws and regulations, applying smart systems, training security cadres, and inspecting various types of facilities.

The Independent Communications Authority of South Africa (ICASA) is the official regulator of the South African communications, broadcasting and postal services sectors.

DECLARATION OF IMEI ASSIGNMENT

The IMEI number is used by a GSM network to identify valid devices and therefore can be used for stopping a stolen phone from accessing that network. For example, if a mobile phone is stolen, the owner can call their network provider and instruct them to blacklist the phone using its IMEI number. This renders the phone useless on that network and sometimes other networks too, whether or not the phone's subscriber identity module (SIM) is changed.

CHECK ALL CERTIFICATES

All newest certificates may be found in our Wiki[2].

2 wiki.teltonika-gps.com/view/FMC125_Certification_%26_Approvals

WARRANTY

We guarantee our products 24-month warranty[1] period.

All batteries carry a 6-month warranty period.

Post-warranty repair service for products is not provided.

If a product stops operating within this specific warranty time, the product can be:

- Repaired
- Replaced with a new product
- Replaced with an equivalent repaired product fulfilling the same functionality
- Replaced with a different product fulfilling the same functionality in case of EOL for the original product

[1] Additional agreement for an extended warranty period can be agreed upon separately.

WARRANTY DISCLAIMER

- Customers are only allowed to return products as a result of the product being defective, due to order assembly or manufacturing fault.
- Products are intended to be used by personnel with training and experience.
- Warranty does not cover defects or malfunctions caused by accidents, misuse, abuse, catastrophes, improper maintenance or inadequate installation – not following operating instructions (including failure to heed warnings) or use with equipment with which it is not intended to be used.
- Warranty does not apply to any consequential damages.
- Warranty is not applicable for supplementary product equipment (i. e. PSU, power cables, antennas) unless the accessory is defective on arrival.
- **More information on what is RMA[1]**

[1] wiki.teltonika-gps.com/view/RMA_guidelines