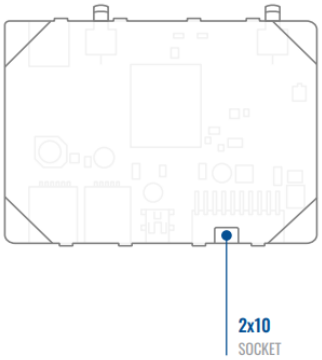
TELTONIKA FMC650 Professional Tracker with CAN Data Reading Feature User Manual

FMC650
Professional tracker with CAN data reading feature

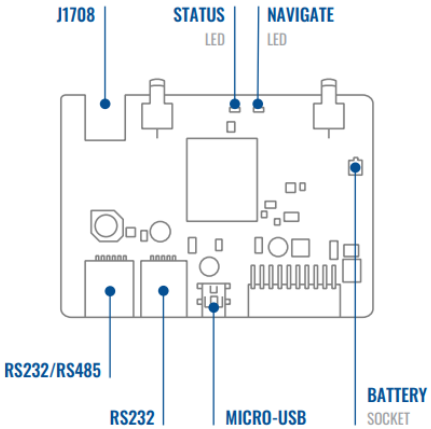
Contents

KNOW YOUR DEVICE

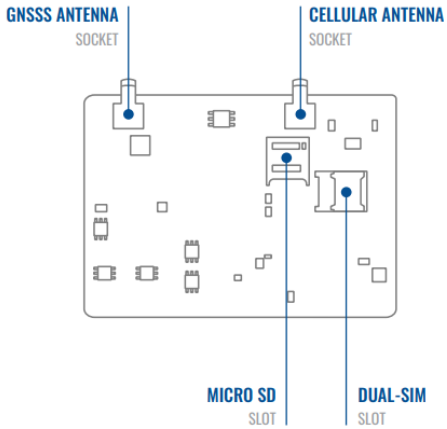
TOP VIEW



BOTTOM VIEW (WITHOUT COVER)

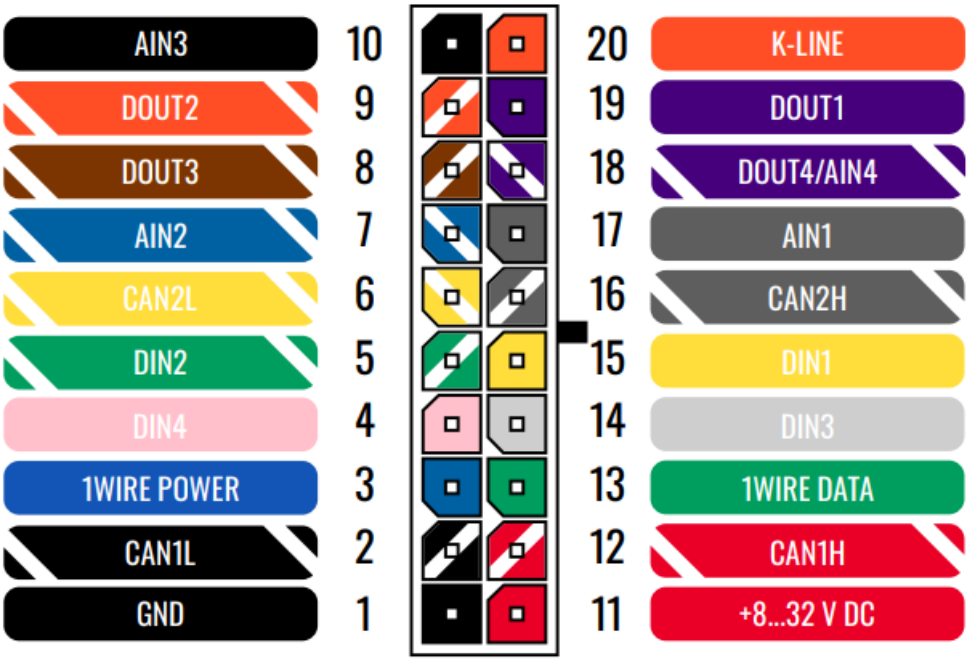


TOP VIEW (WITHOUT COVER)



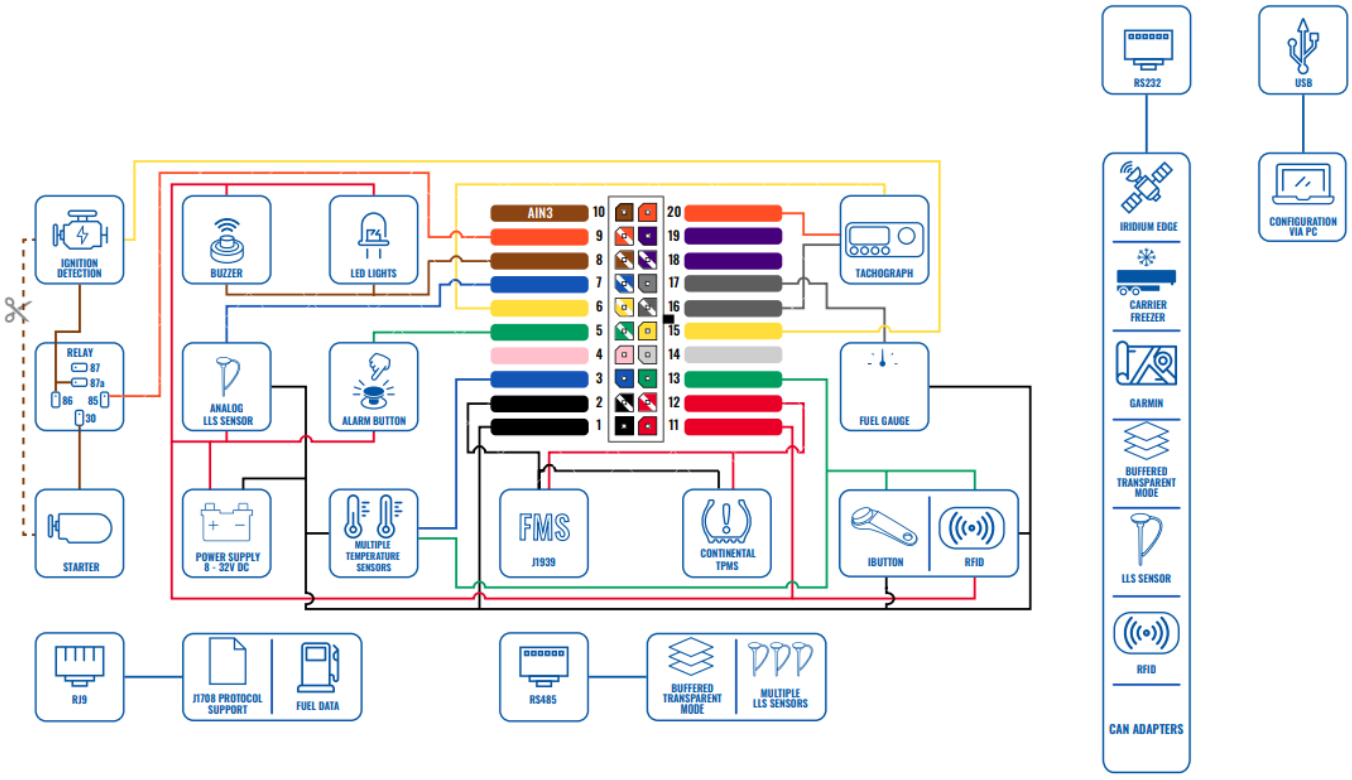
PINOUT

PIN NUMBER	PIN NAME	DESCRIPTION
1	GND (-)	Ground
2	CAN 1L	SAE J1939 CAN interface Low channel 1
3	1WIRE POWER	Power supply pin for Dallas 1-Wire® devices
4	DIN4	Digital input, channel 1
5	DIN2	Digital input, channel 2
6	CAN 2L	SAE J1939 CAN interface Low channel 2
7	AIN2	Analog input, channel 2. Input range: 0-30V/0-10V DC
8	DOUT3	Digital output. Open collector output
9	DOUT2	Digital output. Open collector output
10	AIN3	Analog input, channel 3. Input range: 0-30V/0-10V DC
11	VCC (+)	Power supply (+8-32 V DC)
12	CAN 1H	SAE J1939 CAN interface High channel 1
13	1WIRE DATA	Data channel for Dallas 1-Wire® devices
14	DIN3	Digital input, channel 3
15	IGN (DIN1)	Digital input, channel 1. DEDICATED FOR IGNITION INPUT
16	CAN 2H	SAE J1939 CAN interface High channel 2
17	AIN1	Analog input, channel 1. Input range: 0-30V/0-10V DC
18	DOUT4/ AIN4	Digital output. Open collector output OR Analog input, channel 4. Input range: 0-30V/0-10V DC
19	DOUT1	Digital output. Open collector output
20	K-Line	K-LINE interface for online Tachograph Vehicle Data transfer



FMC650 2×10 socket pinout

WIRING SCHEME

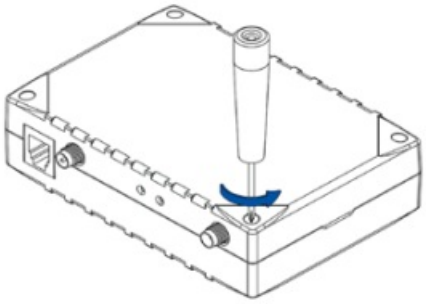


SET UP YOUR DEVICE

HOW TO INSERT MICRO-SIM CARD AND CONNECT THE BATTERY

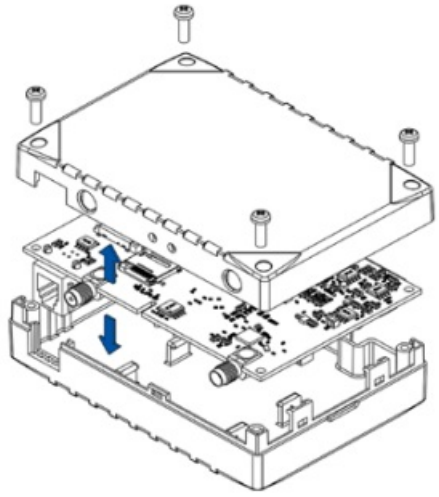
1. UNSCREW SCREWS

   Unscrew 4 screws counterclockwise that are located on the bottom of the device.



2. COVER REMOVAL

   Remove the cover



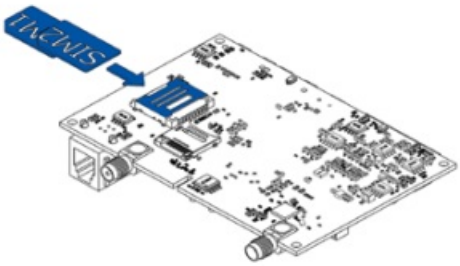
3. SIM CARD INSERT

   Insert SIM card as shown with PIN request disabled or read Security info 1 how to enter it later in Teltonika Configurator 2. Make sure that SIM card cut-off corner is pointing forward to slot.

   SIM slot 1 is closer to PCB, SIM slot 2 is the upper one.

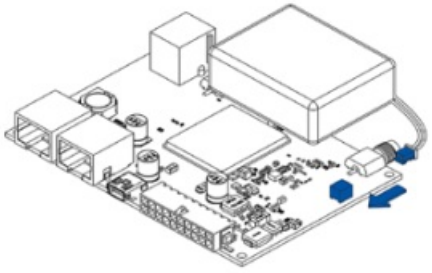
   wiki.teltonika.lt/view/FMC650_Security_info

   wiki.teltonika.lt/view/Teltonika_Configurator



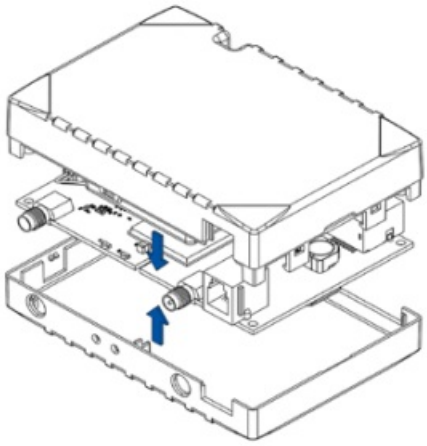
4. BATTERY CONNECTION

   Connect battery as shown to device.



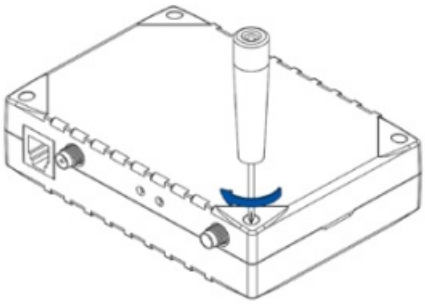
5. ATTACHING COVER BACK

   After configuration, see “PC Connection (Windows)”, attach device cover back.



6. DEVICE IS READY

   Screw in all screws. Device is ready to be mounted.



PC CONNECTION (WINDOWS)

1. Power-up FMC650 with DC voltage (8 – 32 V) power supply using supplied power cable. LED's should start blinking, see "LED indications1".
2. Connect device to computer using Micro-USB cable or Bluetooth connection:
   • Using Mini-USB cable
   • You will need to install USB drivers, see "How to install USB drivers (Windows)2"
3. You are now ready to use the device on your computer.

HOW TO INSTALL USB DRIVERS (WINDOWS)

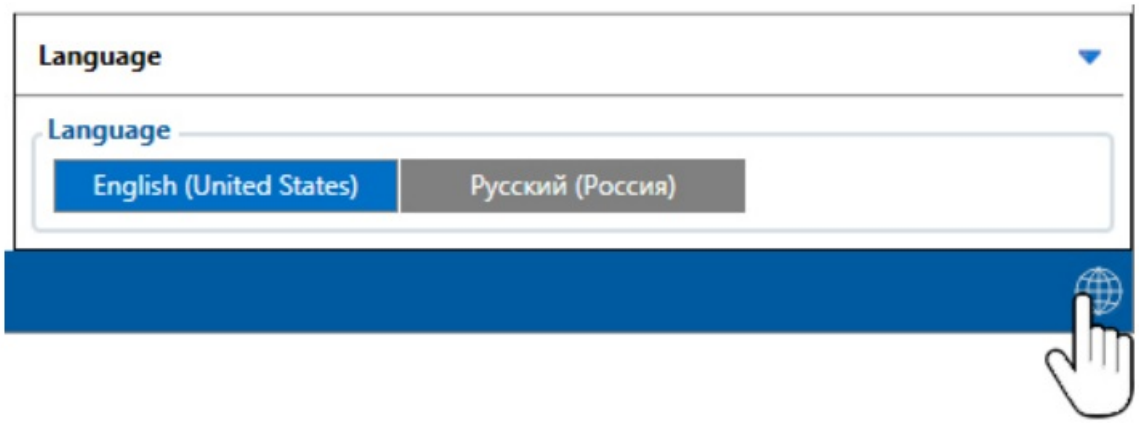
1. Please download COM port drivers from here 1.
2. Extract and run TeltonikaCOMDriver.exe.
3. Click Next in driver installation window.
4. In the following window click Install button.
5. Setup will continue installing the driver and eventually the confirmation window will appear. Click Finish to complete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

CONFIGURATION (WINDOWS)

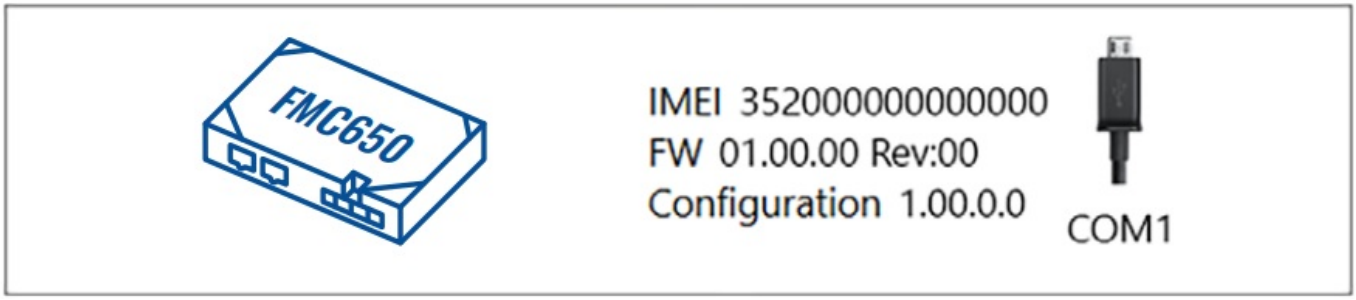
At first FMC650 device will have default factory settings set. These settings should be changed according to the users needs. Main configuration can be performed via Teltonika Configurator 1 software. Get the latest Configurator version from here 2. Configurator operates on Microsoft Windows OS and uses prerequisite MS .NET Framework. Make sure you have the correct version installed.

MS .NET REQUIREMENTS

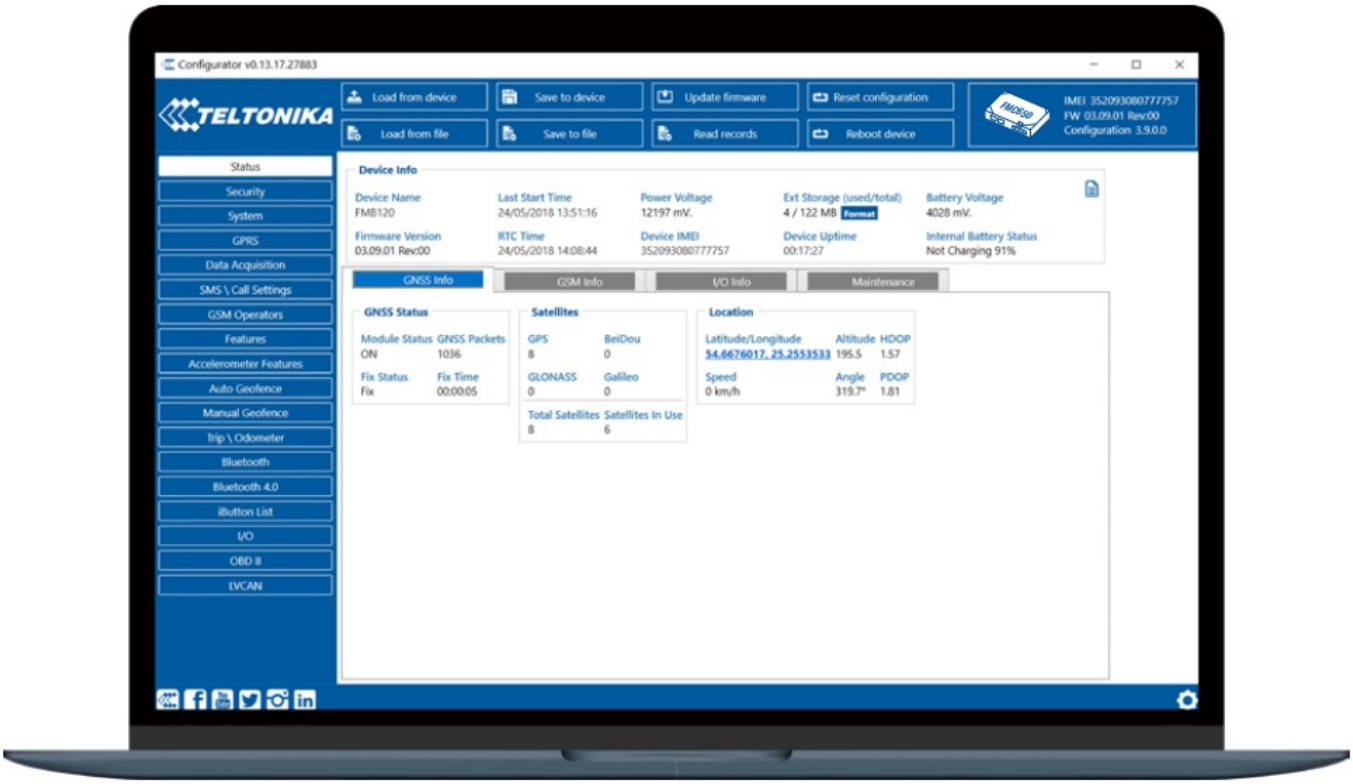
Operating system	MS .NET Framework version	Version	Links
Windows Vista Windows 7 Windows 8.1 Windows 10	MS .NET Framework 4.6.2	32 and 64 bit	www.microsoft.com



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 window1 tabs display information about GNSS2, GSM 3, I/O 4, Maintenance 5 and etc. FMC650 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 settings6 can be configured and

Data Acquisition7 – where data acquiring parameters can be configured. More details about FMC650 configuration using Configurator can be found in our Wiki8.

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»
```

1 2 3 4 5 6

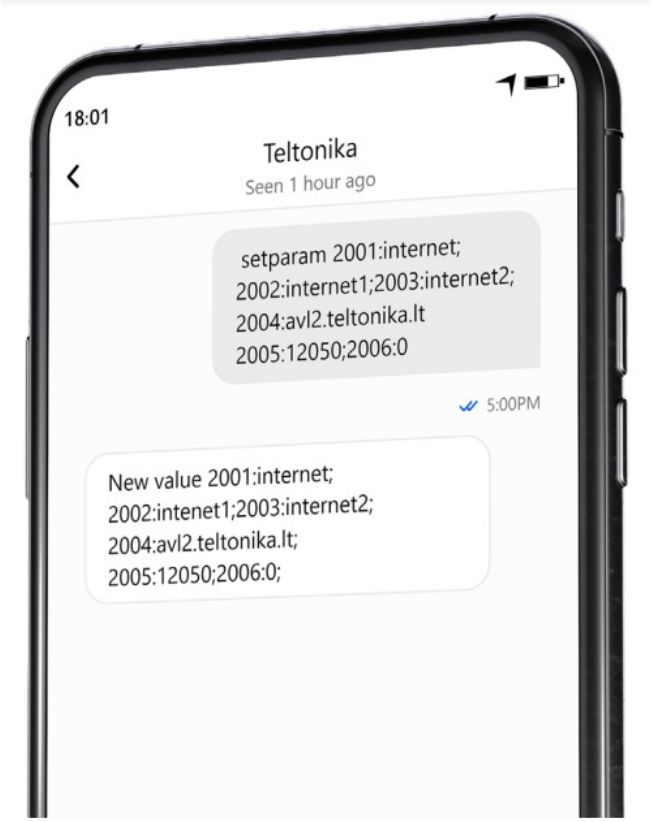
Note: Before SMS text, two space symbols should be inserted.

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, FMC650 device will synchronize time and update records to configured server. Time intervals and default I/O elements can be changed by using Teltonika Configurator1 or SMS parameters2.

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	FMC650-MBX50: MeiG SLM320PE2C, FMC650-MCX50: MeiG SLM320-L16A
Technology	LTE(CaT1)/ 2G(GSM/GPRS)

GNSS

Module Name	Airoha AG3335MB
GNSS	GPS, GLONASS, GALILEO, BEIDOU, QZSS
Receiver	L1 and L5 dual-band GNSS receiver
Tracking sensitivity	-165 dBM
Position Accuracy	< 2.5 CEP
Hot start	< 1.5 s
Warm start	< 25 s
Cold start	< 32 s

CELLULAR

Technology	LTE Cat 1, GSM
2G bands	FMC650-MBX50: B2/B3/B5/B8 FMC650-MCX50: B2/B3/B5/B8
4G bands	FMC650-MBX50: LTE-FDD:B1/B3/B7/B8/B20/B28 LTE-TDD:B38/B40/B41 FMC650-MCX50: LTE-FDD:B1/B2/B3/B4/B5/B7/B8/ B20/B28 LTE-TDD:B40
Data transfer	LTE FDD: Max 10Mbps (DL)/Max 5Mbps (UL) LTE TDD Max 8Mbps (DL)/Max 2Mbps (UL) GPRS: Max 85.6Kbps (DL)/Max 85.6Kbps (UL)
Data support	SMS (text/data)
Transmit power	Class 4 for GSM850/900: 31±2dBm Class 1 for GSM1800/1900: 30±2dBm Class 3 for LTE-TDD: 23±3dBm Class 3 for LTE-FDD: 23±3dBm Bluetooth LE: up to 6.64 dBm

POWER

Input voltage range	8 – 32 V DC with overvoltage (compatible with pulse 5a and pulse 5b) an d reverse polarity protection
Back-up battery	550 mAh 8,4V Ni-MH battery
Internal fuse	3 A, 125 V
2 W max. Current consumption at 12 V	GPRS: average 60 mA Nominal: average 45 mA (with no load) GNSS sleep: average 32 mA Deep Sleep: average 4 mA Online Deep Sleep: average 11 mA Full Load/Peak: <0.25A Max

INTERFACE

Digital Inputs	4
Digital Outputs	4
Analog Inputs	4
1-Wire temperature sensors	
1-Wire iButton	1
RS232	2
RS485	1
CAN J1939	2
J1708	1
K-Line	1
LVCAN/ALLCAN	1
GNSS antenna	External High Gain
GSM antenna	External High Gain
USB	2.0 Mini-USB
LED indication	2 status LED lights

ELECTRICAL CHARACTERISTICS

CHARACTERISTIC DESCRIPTION	VALUE			
SUPPLY VOLTAGE	MIN.	TYP.	MAX.	UNIT
Supply Voltage (Recommended Operating Conditions)	8		32	V

SAFETY INFORMATION

This message contains information on how to operate FMC650 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 +8…+32 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 2×6 connector wires to the vehicle, the appropriate jumpers of the vehicle power supply should be disconnected.
- Before unmounting the device from the vehicle, the 2×6 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 FMC650 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.
	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 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.
wiki.teltonika-gps.com/index.php?title=FMC650

CHECK ALL CERTIFICATES
All newest certificates may be found in our Wiki2.
wiki.teltonika-gps.com/view/FMC650_Certification_%26_Approvals


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

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
  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

wiki.teltonika-gps.com/view/RMA_guidelines

Documents / Resources

	TELTONIKA FMC650 Professional Tracker with CAN Data Reading Feature [pdf] User Manual FMC650 Professional Tracker with CAN Data Reading Feature, FMC650, Professional Tracker with CAN Data Reading Feature, Tracker with CAN Data Reading Feature, Data Reading Feature, Reading Feature

References

- User Manual