



# TFT100

E-Forklift Tracker

Quick Manual

# Table of Contents

<b>Table of Contents</b> .....	<b>2</b>
<b>Know your device</b> .....	<b>3</b>
Pinout .....	4
<b>Set up your device</b> .....	<b>5</b>
How to insert Micro-SIM card and connect the battery .....	5
How to install USB drivers (Windows) .....	6
PC Connection (Windows) .....	6
Configuration (Windows) .....	6
Quick SMS configuration .....	8
<b>Mounting recommendations</b> .....	<b>9</b>
<b>LED indications</b> .....	<b>10</b>
<b>Characteristics</b> .....	<b>10</b>
Basic characteristics .....	10
Electrical characteristics .....	11
<b>Safety information</b> .....	<b>12</b>
<b>Certification and Approvals</b> .....	<b>13</b>

# Know your device

## Top view



## Top view (without cover)

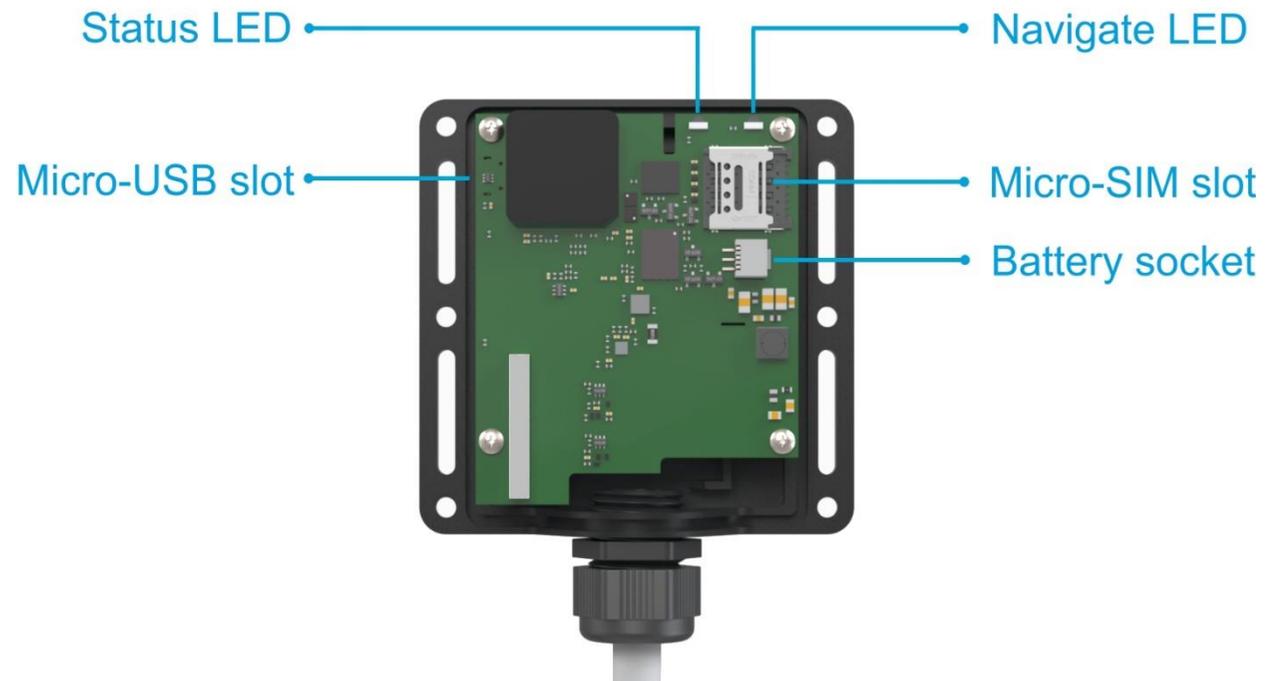


Figure 1 TFT100 device view

# Pinout

**Table 1 TFT100 pinout**

Pin color	CAN Pin name	CAN Description	RS232 Pin name	RS232 Description	RS485 Pin name	RS485 Description	UART Pin name	UART Description
Red	VCC (10-97) V DC (+)	Power supply (+10...+97 V DC)	VCC (10-97) V DC (+)	Power supply (+10...+97 V DC)	VCC (10-97) V DC (+)	Power supply (+10...+97 V DC)	VCC (10-97) V DC (+)	Power supply (+10...+97 V DC)
Black	GND (-)	Ground						
Yellow	1-Wire Power	+3,8 V output for 1-Wire devices	1-Wire Power	+3,8 V output for 1-Wire devices	1-Wire Power	+3,8 V output for 1-Wire devices	1-Wire Power	+3,8 V output for 1-Wire devices
White/Green	CAN-H	CAN interface High	RS232-IN	Input wire for RS232	RS485-B	Signal Wire B for RS485	UART-RX	Input for data reception through UART
White	CAN-L	Can interface Low	RS232-OUT	Output wire for RS232	RS485-A	Signal wire A for RS485	UART-TX	Output for data transmission through UART
Grey	AIN2/DIN2	Analog input, channel 2 / Digital output, channel 2	AIN2/DIN2	Analog input, channel 2 / Digital output, channel 2	AIN2/DIN2	Analog input, channel 2 / Digital output, channel 2	AIN2/DIN2	Analog input, channel 2 / Digital output, channel 2
White/Orange	DOUT1/DIN3	Digital output, channel 1 / Digital input, channel 3	DOUT1/DIN3	Digital output, channel 1 / Digital input, channel 3	DOUT1/DIN3	Digital output, channel 1 / Digital input, channel 3	DOUT1/DIN3	Digital output, channel 1 / Digital input, channel 3
Violet	DOUT2/DIN4	Digital output, channel 2 / Digital input, channel 4	DOUT2/DIN4	Digital output, channel 2 / Digital input, channel 4	DOUT2/DIN4	Digital output, channel 2 / Digital input, channel 4	DOUT2/DIN4	Digital output, channel 2 / Digital input, channel 4
Green	AIN1/DIN1	Analog input, channel 1 / Digital input, channel 1	AIN1/DIN1	Analog input, channel 1 / Digital input, channel 1	AIN1/DIN1	Analog input, channel 1 / Digital input, channel 1	AIN1/DIN1	Analog input, channel 1 / Digital input, channel 1
Blue	1-Wire Data	Data channel for 1-Wire devices	1-Wire Data	Data channel for 1-Wire devices	1-Wire Data	Data channel for 1-Wire devices	1-Wire Data	Data channel for 1-Wire devices

# Set up your device

## How to insert Micro-SIM card and connect the battery

1. **Unscrew** 6 screws counter-clockwise that are located on the **bottom** of the device.
2. Remove the **cover**.
3. Insert **Micro-SIM** card as shown with **PIN request disabled** or read [Security info](#) how to enter it later in **Configurator**. Make sure that Micro-SIM card cut-off corner is pointing forward to slot.
4. Connect **battery** as shown to device.
5. After **configuration**, see "PC Connection (Windows)", attach device **cover** back and **screw** in all screws.
6. Device is ready to be connected.

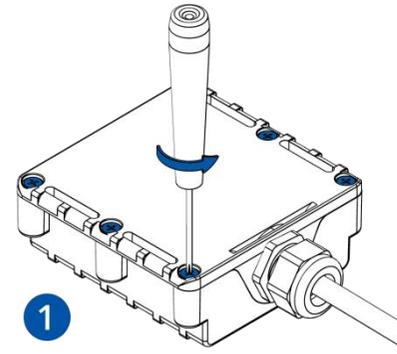


Figure 2 Unscrew screws

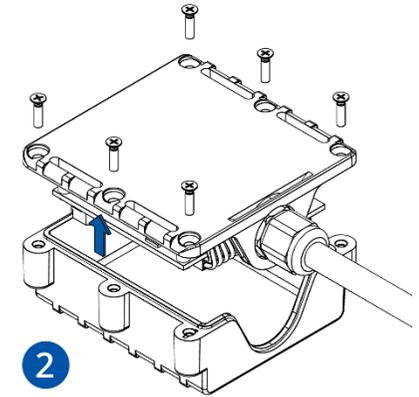


Figure 3 Cover removal

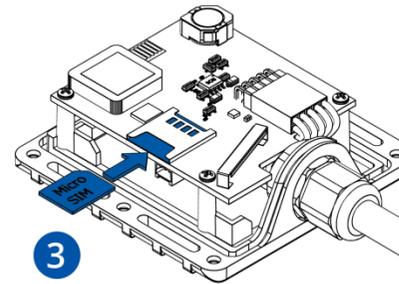


Figure 4 Micro-SIM card insert

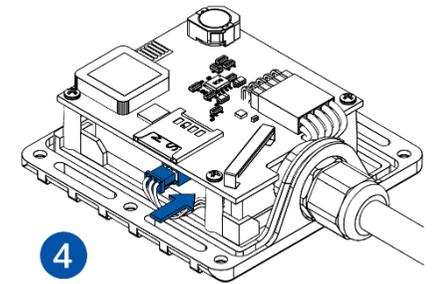


Figure 5 Battery connection

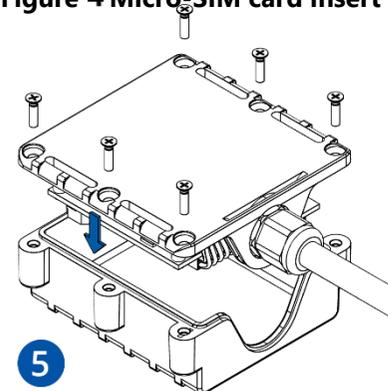


Figure 6 Attaching cover back

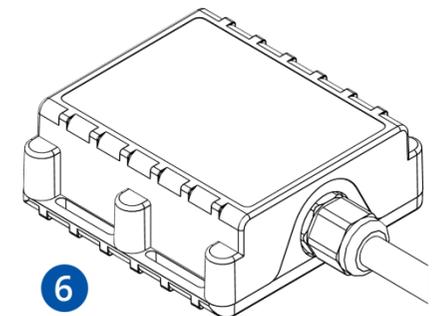


Figure 7 Device is ready

## How to install USB drivers (Windows)

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

## PC Connection (Windows)

1. Power-up TFT100 with **DC voltage (10 – 97 V)** power supply using **power cable**. LED's should start blinking, see "LED indications".
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 \(Windows\)](#)"
  - Using **Bluetooth**
    - TFT100 Bluetooth is enabled by default. Turn on **Bluetooth** on your PC, then select **Add Bluetooth or other device** > **Bluetooth**. Choose your device named – "**TFT100\_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.

## Configuration (Windows)

At first TFT100 device will have default factory settings set. These settings should be changed according to the user's 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.

**Table 2 MS .NET requirements**

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	<a href="http://www.microsoft.com">www.microsoft.com</a>

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 ([Figure 8 Language selection](#)).

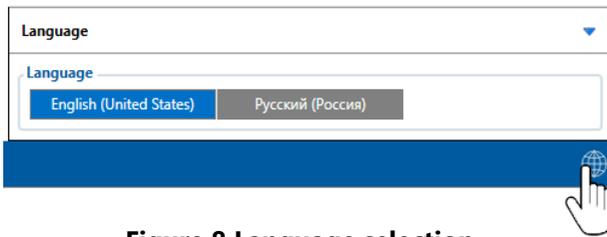


Figure 8 Language selection

Configuration process begins by pressing on connected device (Figure 9 Device connected via USB).



Figure 9 Device connected via USB

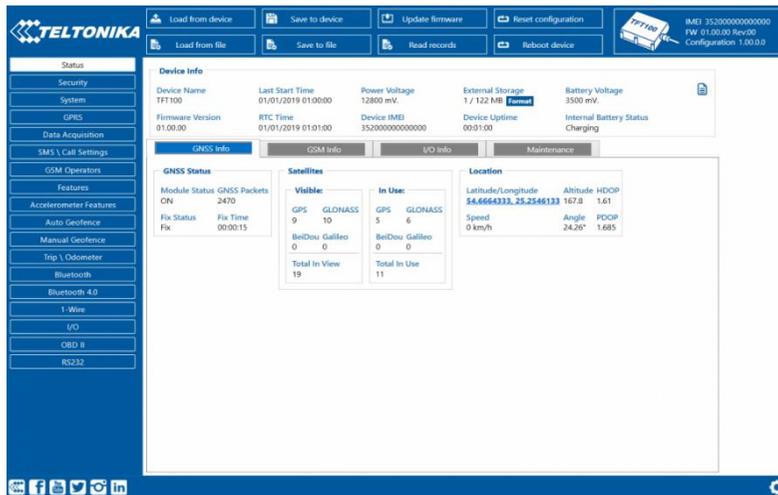


Figure 10 Configurator Status window

After connection to Configurator [Status window](#) will be displayed (Figure 10 Configurator Status window).

Various [Status window](#) tabs display information about [GNSS](#), [GSM](#), [I/O](#), [Maintenance](#) and etc. TFT100 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:

1. **Load from device** – loads configuration from device.
2. **Save to device** – saves configuration to device.
3. **Load from file** – loads configuration from file.
4. **Save to file** – saves configuration to file.
5. **Update firmware** – updates firmware on device.
6. **Read records** – reads records from the device.
7. **Reboot device** – restarts device.
8. **Reset configuration** – sets device configuration to default.

Most important configurator section is **GPRS** – where all your server and [GPRS settings](#) can be configured and [Data Acquisition](#) – where data acquiring parameters can be configured.

More details about TFT100 configuration using Configurator can be found in our [Wiki](#).

# 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:

- 2001 – APN
- 2002 – APN username (if there are no APN username, empty field should be left)
- 2003 – APN password (if there are no APN password, empty field should be left)

Server settings:

- 2004 – Domain
- 2005 – Port
- 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 10 – 97 V or CAN

Device makes a record **On Moving** if one of these events happen:



300 seconds passes



Vehicle turns 10 degrees



Vehicle drives 100 meters



Speed difference between last coordinate and current position is greater than 10 km/h

Device makes a record **On Stop** if:



1 hour passes while vehicle is stationary and ignition is off

Records sending to server:



If device has made a record it is sent to the server every 120 seconds

After successful SMS configuration, TFT100 device will **synchronize time** and **update records to configured server**. Time intervals and default I/O elements can be changed by using [Teltonika Configurator](#) or **SMS parameters**.

# Mounting recommendations

- Connecting wires
  - Wires should be fastened to stable wires or other non-moving parts. Any heat emitting and/or moving objects should be kept away from the wires.
  - There should be no exposed wires. If factory isolation was removed while connecting the wires, the isolation material should be applied.
  - 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 and the wires should not be loose.
  - Wires cannot be connected to the board computers or control units.
- Connecting power source
  - Be sure that after the car computer goes to sleep mode, power might be still available on the power wires. Depending on the car model, this may happen in 5 to 30 minutes period.
  - When the module is connected, measure the voltage again to make sure it did not decrease.
  - It is recommended to connect to the main power cable in the fuse box.

- 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.



**PAY ATTENTION! Connecting the power supply must be carried out in a very low impedance point of on-board vehicle network. Connecting the GND at an arbitrary point to the mass of the car is unacceptable, as static and dynamic potentials on the line GND will be unpredictable, which can lead to unstable TFT100 operation and even its failure.**

# LED indications

**Table 3 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

**Table 4 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

# Characteristics

## Basic characteristics

**Table 5 Basic characteristics**

Module	
Name	TM2500
Technology	GSM, GPRS, GNSS, BLUETOOTH 4.0 + LE
GNSS	
GNSS	GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS, DGPS, AGPS
Receiver	33 channel
Tracking sensitivity	-165 dBm
Accuracy	< 3 m
Hot start	< 1 s
Warm start	< 25 s
Cold start	< 35 s
Cellular	
Technology	GSM
2G bands	Quad-band 850 / 900 / 1800 / 1900 MHz
Data transfer	GPRS Multi-Slot Class 12 (up to 240 kbps), GPRS Mobile Station Class B
Data support	SMS (text/data)

<b>Power</b>	
<b>Input voltage range</b>	10-97 V DC with overvoltage protection
<b>Back-up battery</b>	1800 mAh Li-ion battery 3.7 V
<b>Power consumption</b>	350 mA max @ 10 V

<b>Interface</b>	
Digital Input	4
Analog Input	2
Digital Output	2
1-Wire Data	1
1-Wire Power	1
RS485 (A-B) ( <i>RS485 modification</i> )	+
RS232 (IN-OUT) ( <i>RS232 modification</i> )	+
UART (RX-TX) ( <i>UART modification</i> )	+
CAN (CAN H-CAN L) ( <i>CAN modification</i> )	+
GNSS antenna	Internal High Gain
GSM antenna	Internal High Gain
USB	2.0 Micro-USB
LED indication	2 status LED lights
SIM	Micro-SIM
Memory	128MB internal flash memory

<b>Physical specification</b>	
Dimensions	72,5 x 73 x 27,3 mm (L x W x H)
Weight	205 g

<b>Operating environment</b>	
Operating temperature (without battery)	TBD

Storage temperature (without battery)	TBD
Operating humidity	TBD
Ingress Protection Rating	IP67

<b>Features</b>	
Sensors	Accelerometer
Scenarios	Eco/Green Driving, Over Speeding, Jamming, <a href="#">Excessive Idling</a> , <a href="#">Towing detection</a> , <a href="#">Crash detection</a> , Auto Geofence, Trip, Immobilizer, iButton, DOUT control via call
Sleep modes	<a href="#">GPS Sleep</a> , <a href="#">Online Deep Sleep</a> , <a href="#">Deep Sleep</a> , <a href="#">Ultra Deep Sleep</a>
Configuration and firmware update	<a href="#">FOTA Web</a> , <a href="#">FOTA</a> , <a href="#">Teltonika Configurator (USB)</a>
SMS	Configuration, Events, DOUT control, Debug
GPRS commands	Configuration, DOUT control, Debug
Time Synchronization	GPS, NITZ, NTP

## Electrical characteristics

**Table 6 Electrical characteristics**

Characteristic description	Value			
	Min.	Typ.	Max.	Unit
<b>Supply Voltage</b>				
Supply Voltage (Recommended Operating Conditions)	+10		+97	V

# Safety information

This message contains information on how to operate TFT100 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 allowed voltage range is +10..+97 V DC.
- To avoid mechanical damage, it is advised to transport the device in an impact-proof package.



**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 if the device housing is not properly closed.**



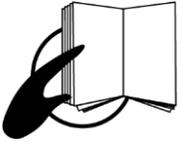
**Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.**



**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

- CE RED - pending



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](#).



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



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).