TELTONIKA

MSP500

Tracker for speed limiting

Quick Manual
v1.0

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Top view
(without cover)

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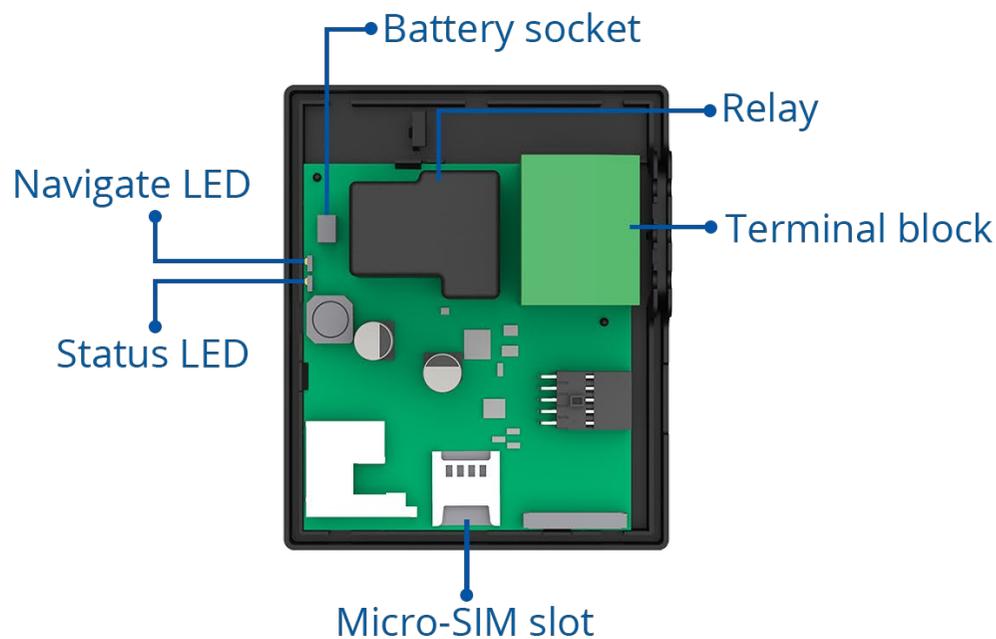
Figure 1 MSP500 device view

Pinout

Table 1 MSP500 pinout

PIN NUMBER	PIN NAME	DESCRIPTION
1	VCC (10-32)V	Power supply (10-32) V DC (+)
2	RS232 GND	RS232 Ground pin
3	RS232-TX	Output for data transmit through RS232
4	USB DATA +	Differential serial data +
5	USB DATA-	Differential serial data -
6	GND	Ground pin. (10-32)V DC
7	AIN1	Analog input, channel 1. Input range: 0-30 V DC.
8	RS232-RX	Input for data receive through RS232
9	USB GND	Ground PIN for USB
10	USB +5V	Power supply for USB

Figure 2 MSP500 socket pinout
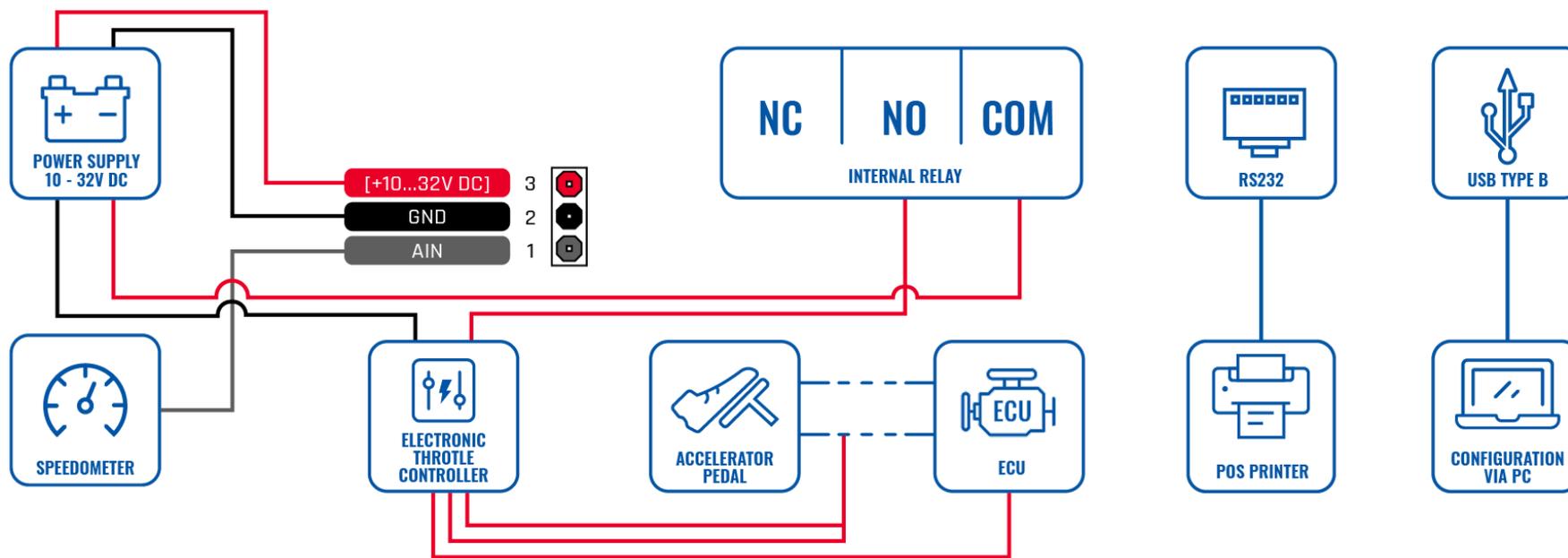
Wiring scheme

Figure 3 MSP500 Wiring scheme

Set up your device

How to insert Micro-SIM card and connect the battery

1. Gently remove MSP500 **cover** using **plastic pry tool** from both sides.
2. Insert **Micro-SIM** card as shown with **PIN request disabled** or read our **Wiki** how to enter it later in **Teltonika Configurator**. Make sure that Micro-SIM card **cut-off corner** is pointing forward to slot.
3. Connect **battery** as shown to device. Position the battery in place where it does not obstruct other components.
4. After **configuration**, see "**PC Connection (Windows)**", attach device **cover** back.

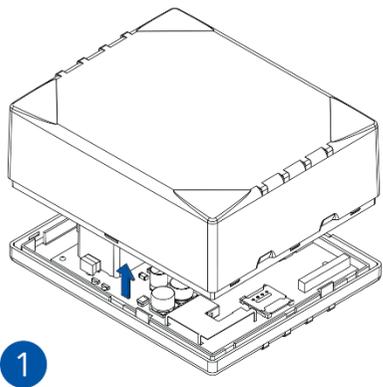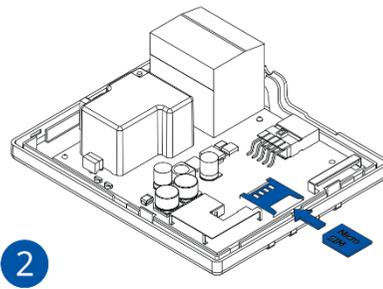**Figure 4 Cover removal**

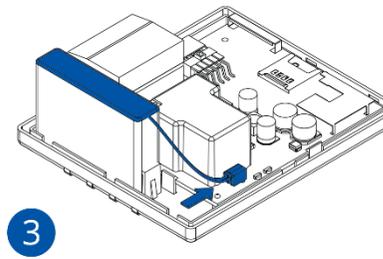**Figure 5 Micro-SIM card insert**
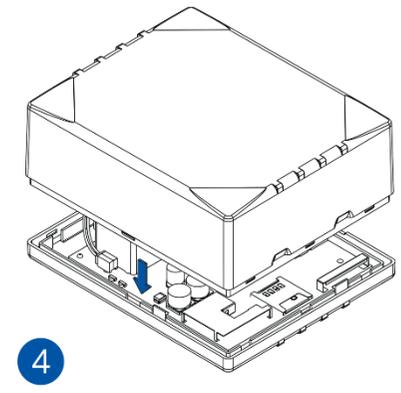
Figure 6 Battery connection

Figure 7 Attaching cover back

PC Connection (Windows)

1. Power-up MSP500 with **DC voltage (10 – 32 V)** power supply using **power cable**. LED's should start blinking, see "**LED behaviour** ".
2. Connect device to computer using **USB Type-B cable**.

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.

Configuration (Windows)

At first MSP500 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. 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	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 (**Figure 8 Language selection**).
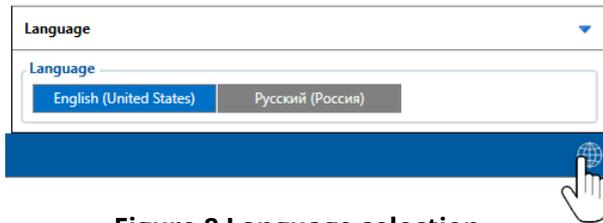
Figure 8 Language selection

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

Figure 9 Device connected via USB

After connection to Configurator **Status window** will be displayed (**Figure 10 Configurator Status window**).
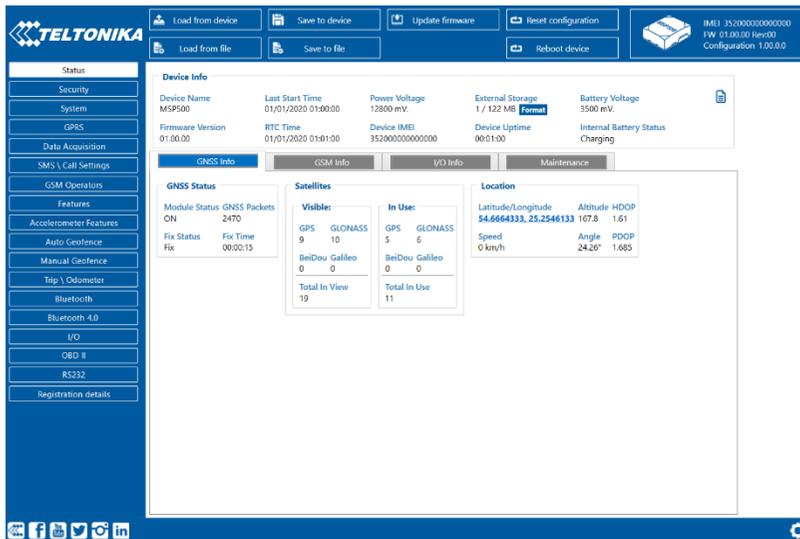
Figure 10 Configurator Status window

Various **Status window** tabs display information about **GNSS**, **GSM**, **I/O**, **Maintenance** and etc. MSP500 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. **Reboot device** – restarts device.
7. **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 MSP500 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"
```
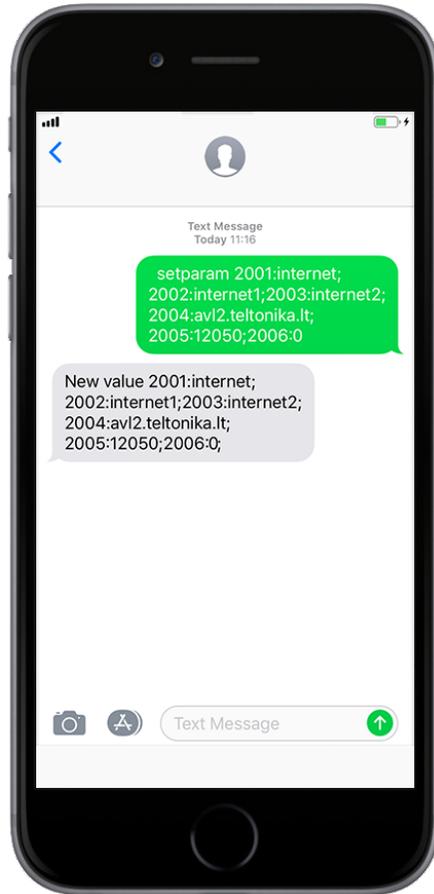
Note: Before SMS text, two space symbols should be inserted.

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 13,2 – 32 V

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, MSP500 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.
  - 3 A, 125 V external fuse shall be used.

- 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 MSP500 operation and even its failure.

LED behaviour

Characteristics

Basic characteristics

Table 3 Navigation LED behaviour

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 behaviour

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

Table 5 Basic characteristics

MODULE	
Name	Teltonika TM2500
Technology	GSM/GPRS/GNSS/BLUETOOTH

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)

POWER

Input voltage range	10-32 V DC with overvoltage protection
Back-up battery	400 mAh Ni-MH battery 7.2 V (2.88 Wh)
Internal fuse	3.7 A, 33 V
Power consumption	At 12V < 1.4 mA (Ultra Deep Sleep) At 12V < 3.8 mA (Deep Sleep) At 12V < 4.1 mA (Online Deep Sleep) At 12V < 8.6 mA (GPS Sleep) At 12V < 26.6 mA (Nominal)

BLUETOOTH

Specification	4.0 + LE
Supported peripherals	Temperature and Humidity sensor, Headset, OBDII dongle, Inateck Barcode Scanner

INTERFACE

Analog input	1
RS232	1
Internal relay	1
Internal buzzer	1
Terminal block	3 contacts
GNSS antenna	Internal High Gain
GSM antenna	Internal High Gain
USB	Type-B
LED behaviour	2 status LED lights
SIM	Micro-SIM + eSIM possibility
Memory	128MB internal flash memory

PHYSICAL SPECIFICATION

Dimensions	103 x 86 x 39 mm (L x W x H)
Weight	250 g

OPERATING ENVIRONMENT

Operating temperature (without battery)	-40 °C to +85 °C
Storage temperature (without battery)	-40 °C to +85 °C
Operating humidity	5% to 95% non-condensing
Ingress Protection Rating	IP65
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 with relay control, Jamming detection, GNSS Fuel Counter, Excessive Idling detection, Unplug detection, Towing detection, Crash detection, Auto Geofence, Manual Geofence, Trip
Sleep modes	GPS Sleep, Online Deep Sleep, Deep Sleep, Ultra Deep Sleep
Configuration and firmware update	FOTA Web, FOTA, Teltonika Configurator (USB, Bluetooth)
SMS	Configuration, Events, Debug
GPRS commands	Configuration, Debug
Time Synchronization	GPS, NITZ, NTP
Fuel monitoring	LLS (Analog), ODBII dongle
RS232 modes	Log mode, NMEA, LLS, TCP ASCII/Binary, LCD, RFID HID/MDF7, Garmin FMI, POS Printer
Ignition detection	Accelerometer, External Power Voltage, Engine RPM (OBDII dongle)

Electrical characteristics

Table 6 Electrical characteristics

CHARACTERISTIC DESCRIPTION	VALUE			
	MIN.	TYP.	MAX.	UNIT
SUPPLY VOLTAGE				
Supply Voltage (Recommended Operating Conditions)	+10		+32	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		146.7		kΩ

Safety information

This message contains information on how to operate MSP500 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 wires to the vehicle, the appropriate jumpers of the vehicle power supply should be disconnected.
- Before unmounting the device from the vehicle, wires 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 60950-1 standard.
  The device MSP500 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.

Warranty

TELTONIKA guarantees its products to be free of any manufacturing defects for a period of **24 months**. With additional agreement we can agree on a different warranty period, for more detailed information please contact our sales manager.

Contact us teltonika.lt/company/contacts

All batteries carry a reduced <u>6 month</u> warranty period.

If a product should fail 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
- TELTONIKA can also repair products that are out of warranty at an agreed cost.

Warranty Disclaimer

TELTONIKA PRODUCTS ARE INTENDED TO BE USED BY PERSONS WITH TRAINING AND EXPERIENCE. ANY OTHER USE RENDERS THE LIMITED WARRANTIES EXPRESSED HEREIN AND ALL IMPLIED WARRANTIES NULL AND VOID AND SAME ARE HEREBY EXCLUDED. ALSO EXCLUDED FROM THIS LIMITED WARRANTY ARE ANY AND ALL INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING BUT NOT LIMITED TO, LOSS OF USE OR REVENUE, LOSS OF TIME, INCONVENIENCE OR ANY OTHER ECONOMIC LOSS.

More information can be found at teltonika.lt/warranty-repair