# TORP TC500 TROUBLESHOOTING MANUAL.





In this document are described the most common errors and issues that can occur while using the TC500 Controller.

Most issues stem from improper installation, so first make sure you have followed the installation manual and that all connectors are pressed tightly together (a clicking sound must be heard when connected).

Before the first ride and after each firmware update, hall sensors and throttle must be calibrated.

**Important:** Torp controller must be used with a circuit breaker (fuse) at all times! Not using the circuit breaker with the TC500 controller is dangerous and can cause serious damage.



Damages caused by improper installation, not using a circuit breaker, or using tools and parts that are not included with the TC500 controller, are not covered by the warranty.

## -USE THE CONTROLLER APP AS A DIAGNOSTIC TOOL:

Connect to the controller with the Torp App and take a short ride, with the App open on the first screen, running in the foreground. During this step, you must not lock the phone`s screen. An error message should appear on the first screen.

In case, you are unable to resolve the issue by yourself, contact the Torp support team at **support@torp.hr** and **make sure to include:** 

-Serial number of the controller (can be found on the sticker at the side of the controller); -The detailed description of the problem, including the Error code

Our team will look through the received information and help you solve the issue.



-CRASH SENSOR: Crash sensor activates in case of a fall. Turn the bike off and turn it back on after a few seconds to continue riding.

#### LIMIT:

-TEMP CONTROLLER: The temperature of the controller has reached the top limit value. The power will be gradually reduced.

-TEMP MOTOR: The temperature of the motor is rising. To prevent overheating, the power will be gradually reduced. The motor temperature limit is set in the "Motor Temp Cuttoff" settings on the "Settings" screen.

-MOTOR TEMP SENSOR: Motor temperature sensor is not connected. Power is limited.

-LOW VOLTAGE: The battery is almost drained or there is a voltage sag due to the acceleration. The power will be gradually reduced.

-LOW REGEN: The battery is nearly full. The regen will be reduced.

-BATTERY TEMP: Battery temperature has reached limit values so the power will be reduced.

-BMS TEMP: Discharge mosfets in BMS have overheated. Power will be gradually reduced.

#### CUTOFF

-CUTOFF LOW VOLTAGE: The battery is completely drained and the bike will not start. You can set the cutoff value in Voltage Min setting in the App (3rd Screen) . Charge the battery to continue riding.

#### ERROR

-OVERVOLTAGE: Battery voltage is above 90V.

-UNDERVOLTAGE: Battery voltage dropped under the values set in the controller's settings. Charge the battery.

-OVERCURRENT: Motor Current is above permitted limit.

-CONTROLLER OVERTEMP: Controller has overheated. Wait for it to cool down to continue riding.

-MOTOR OVERTEMP: Motor has overheated. Wait for it to cool down to continue riding.

-PHASE FET: MOSFET error: Controller`s phase is in short-circuit. Contact the manufacturer.

-HALL SENSOR: Motor Hall Sensor connector is not connected, or there is a problem with the Hall Sensor itself. <u>Check the</u> wiring.

-THROTTLE PROBLEM: The problem with a throttle wiring was detected, that has been solved in the meantime. Turn your bike off and on again to continue riding.

-THROTTLE #1: Throttle ADC rises too fast. Throttle plus(+) short on gnd(-). -THROTTLE #2: Throttle not

connected. Probably throttle plus(+) wire is broken.

-THROTTLE #3: Throttle plus(+) and gnd(-) shorted.

-THROTTLE #4: Throttle gnd(-) not connected or broken.

-THROTTLE #5: Throttle plus(+) shorted on signal.

-CUTOFF THROTTLE: The throttle has been activated while the bike is being turned on.

-1st solution: Release the throttle when turning on the bike;

-2nd solution: Re-calibrate the throttle (see the "Setting up the Throttle" section of this document);

-3rd solution: Check the wiring. -CUTOFF BATTERY TEMP: The battery has overheated. The bike will stop until it cools down.

-HALL PROBLEM: The Hall sensor disconnected during the ride. Check the wiring.

-HALL DISCONNECTED: The Hall sensor disconnected during the ride. Check the wiring.

-CUTOFF BMS TEMP: The BMS mosfet temperature has reached the limit. The bike will stop until it cools down. -WATER IN CONNECTOR (works with HW version 1.4 and higher): Water entered the main connector. Turn off the bike immediately, disconnect the main connector, and dry it out.

#### WATER IN CONNECTOR



WARNING! Water in the main connector! Turn off the bike immediately, disconnect the main connector, and dry it out!

## -WRONG MOTOR TEMPERATURE MEASUREMENT:

## How does the problem manifest?

There is a motor over temp warning on the app screen and the power cuts off. This happens early in the ride when the motor should still be cold.

## Detecting and solving an issue:

Most likely the problem is in the wiring or the motor temperature sensor. At the moment you start the bike, the motor and controller temperature should be almost the same.

## Inspecting the wiring harness:

There are 3 connected wiring harnesses:

- -Motor wiring harness
- -Surron wiring harness
- -Torp wiring harness

To detect the problem, you will have to inspect all three wiring harnesses separately.

First, make sure all wiring is connected and then connect to the controller with the Torp App and then follow these steps:

## -Motor wiring harness:

Check the connector pins of the motor (shown below) for any signs of oxidation. If the pins look ok, move the wires on the connector as shown in the photo and see if the temperature changes in the app.



If the values look ok, then move on to:

**-Surron wiring harness:** Move the wires that connect the Surron Wiring harness with the Controller on the bike`s end, as shown in the photo:



If the temperature values in the app look ok, then check the wiring on the controller`s wiring harness:

-Move the wires that connect the controller to the SurRon wiring harness as shown in the photo above.

If during the inspection, the temperature in the app doesn`t change, you should **inspect the temperature sensor.** 

To check the temperature sensor you will have to reach the wires in the motor. To do this you will have to remove the motor`s skid plate.

Then do the following:

Take the multimeter and measure the resistance in the marked pins.



The multimeter should show 500-600 ohms.

If the first measurement looks ok, try also measuring the resistance in the abovedescribed way while moving the temperature sensor wires. The resistance should show 500-600 ohms again.

In case the measurements are off, then the problem lies in the broken temperature sensor, which must be replaced. The temperature sensor type is KTY84/130.

The TC500 controller can not work without a fully functional motor temperature sensor!

If the above-described measurement still looks ok, try measuring the resistance on the controller`s connector, as shown in the photo below.

Unplug the main connector from the controller, but leave the rest of the plugs connected.

Use the multimeter to measure the resistance on the marked pins:



In case these measurements are off, the problem lies either in the Torp Wiring harness or the SurRon wiring. Further inspection of the wiring is needed to detect and repair the problem.

## -PROBLEMS WITH BATTERY COMMUNICATION:

#### How does the problem manifest?

Error 002 is shown on the display.

## **Detecting and solving an issue:**

Make sure that the 3-pin connector on the Torp Controller wiring harness is properly connected:

-When the connectors are pressed together, you must hear a clicking sound -Make sure the correct connectors are pressed together.

On the OLD Controller wiring, the communication connector is white and must be connected to the black SurRon connector.



On the NEW wiring harness, the Torp Controller communication connector is black.

In both cases, the Torp Communication connector must be connected to the BLACK SurRon wiring connector!

## -TORP CONTROLLER IS NOT WORKING:

# How does the problem manifest?

When connected the bike does not start. The green light on the controller is not lit. There are various causes.

In case you see the PHASE 2 FET or PHASE 3 FET error in the Torp App, you should contact the Torp Support team at support@torp.hr. Make sure to include the Serial Number and the description of your problem.

# Detecting and solving an issue:

In case **the green led light is not turning on and the headlight on your SurRon bike** is not turning on, the problem might be caused by a broken thin red Vcc wire, that is connected to the main power of the battery (+) of the bike.



In case **the green light on the controller is lit, but the headlight doesn`t work**, the problem might lie in the broken thin black ground wire that is connected to the main power cable of the battery (-) of the bike (as shown in the photo below).



If these two wires are ok, disconnect the main connector on the controller and check the pins. In case the pins have oxidated or are broken, you should contact the Torp support team directly at support@torp.hr with the serial number of your controller and a detailed description of your problem.

## -CAN`T REACH 8,5 KW WITH THE 38AH STOCK SURRON BATTERY:

## How does the problem manifest?

The power estimate on the Settings Screen does not display 8,5kW.

## Detecting and solving an issue:

-This option works ONLY with the stock SurRon 38Ah battery with 37Ah capacity marked on the sticker. To confirm that this is really the battery type you are using, lift the battery from the frame and check the sticker on the bottom of the battery.

With the stock SurRon 38Ah battery with (nominal) 38,5 Ah capacity, you will be able to reach 7kW. You can also distinguish this battery from the 37Ah battery, by having both, Nominal and Rated capacities written on the sticker.



-THROTTLE ERRORS:



## How does the problem manifest?

A throttle error form 1-5 is displayed on the 1st screen of the app and the throttle response feels off.

## Detecting and solving an issue:

Check the wiring and make sure all connectors are pushed together correctly.

Make sure you have calibrated the throttle before the first use and after each new firmware update. In case you are using an aftermarket throttle handle, make sure to use Domino or Magura throttle.

In case non of the above works, contact our support team directly at support@torp.hr. Go to the diagnostics screen on the 5th screen in the App and record a screen video while quickly turning the throttle handle and send the video to our team to inspect.

Make sure to include: -the serial number of your controller, -an error code, and -a detailed description of your problem.

## -SPEED NOT DISPLAYED CORRECTLY:

## How does the problem manifest?

The displayed speed does not correspond to the perceived speed.

## Detecting and solving an issue:

First, to make sure the speed is not displayed correctly, please use a third-party GPS app to measure the exact speed and compare the values. If there is a discrepancy in values, you should make sure you have entered the correct wheel diameter on the 5th screen of the Torp App.



The tire must be included in the measurement when the wheel diameter is measured.



In case the values are entered correctly, we suggest you tune the Sprocket Ratio and Wheel Diameter values according to the GPS measurement, until the speed in the App does not correspond the speed in the GPS.

## -HALL SENSORS CAN`T BE CALIBRATED:

## How does the problem manifest?

You are not able to calibrate the hall sensors. You are getting an error message "Timeout, the bike is moving" when trying to calibrate.

# Detecting and solving an issue:

The problem is caused by a faulty brake pin.

To solve the issue, go to the 4th screen in the app and set the throttle released regen and Brake lever regen to 0A. Then calibrate the Hall Sensors.



Once the calibration is finished, re-set your Throttle release Regen and Brake lever regen to desired values.

In case your issue is not described in this document, don`t hesitate to contact our support team at support@torp.hr.

Make sure to include:

- -The serial number of your controller
- -Detailed description of your issue
- -Error code that is displayed on the 1st screen of your Torp App

Our team will then look at the issue and contact you with the solution.