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ASTROPHYSIK POTSDAM



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SONNENPHYSIK (KIS)



MAX PLANCK INSTITUT  
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FORSCHUNG

# GREGOR: Small Motor disconnection

**Document No.:** GRE-KIS -MAN-0027

**Version:** 1

**Date:** 2024-07-29

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## Signatures & Approval

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Released by

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Change Log				
Vers.	Date	Author	Description of Changes	Sect./Para.
1	2024-07-29	Grassin	New Document	

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## 1 Scope

This document explains the procedure to disconnect a motorization securely, for maintenance operations, where M3 motor is taken as an example and described below.

## 2 Reference and applicable documents [if needed]

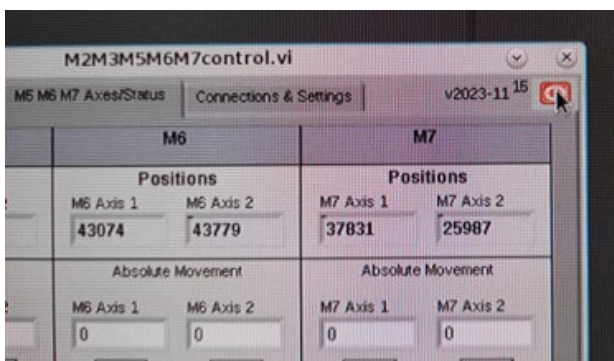
## 3 Overview

The process to remove securely a motor, its cables or connector, from the GREGOR Small Motorization framework must follow a defined order, to avoid damage of the driver internal components, mainly the MOSFET power output and encoders stages, the motor itself or cause a mechanical issue during the operation.

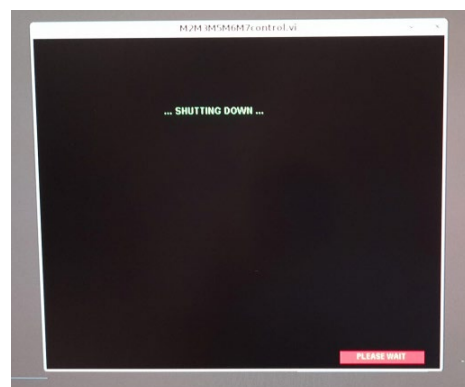
## 4 Disconnection steps

The process is essentially similar for the other motorization. The case of the M3 is explained, here. It does not refer to the case where all or a branch of the Motorization tree is powered off, but on the contrary, on power operation and it is needed to disconnect a motor without interfering with the other ones, losing their control and positions. At this point, please follow the steps:

1. On the GCS (GREGOR Control System) computer, shutdown the interface, hosting the desired motorization. The use of the "Stop" button of the program is required, to close the communications with the DCP server and the corresponding Xport. Avoid the "Exit" window button at the extreme top/right, that produces a hard closing of the interface. (Use it only in case of frozen or irresponsive interface).

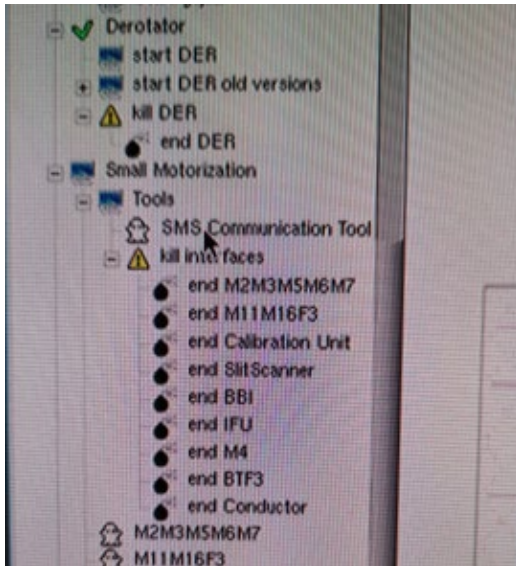


Picture 1 - Stop button

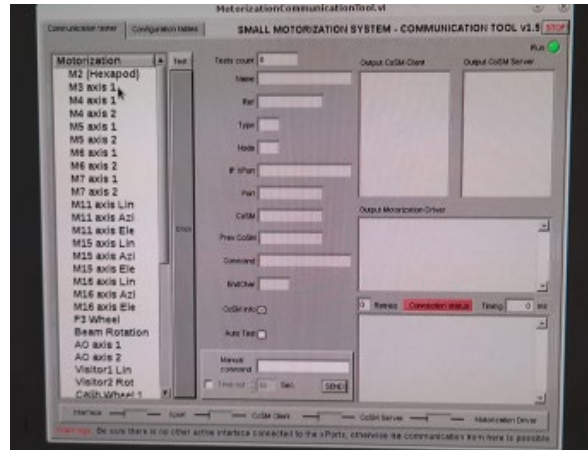


Picture 2 - Shutting down...

- At the ICS (Instrument Control System) of the GCS, open the SMS Communication Tool, in the left panel side of the interface.

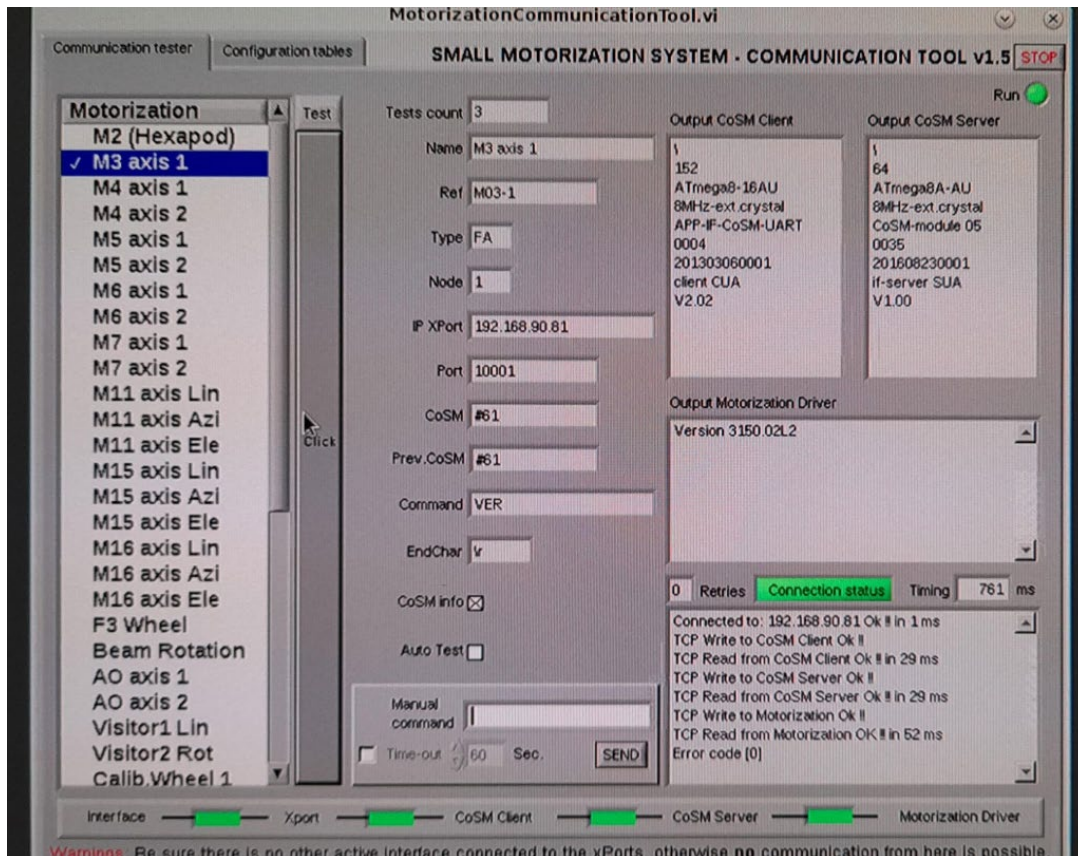


Picture 4 - ICS



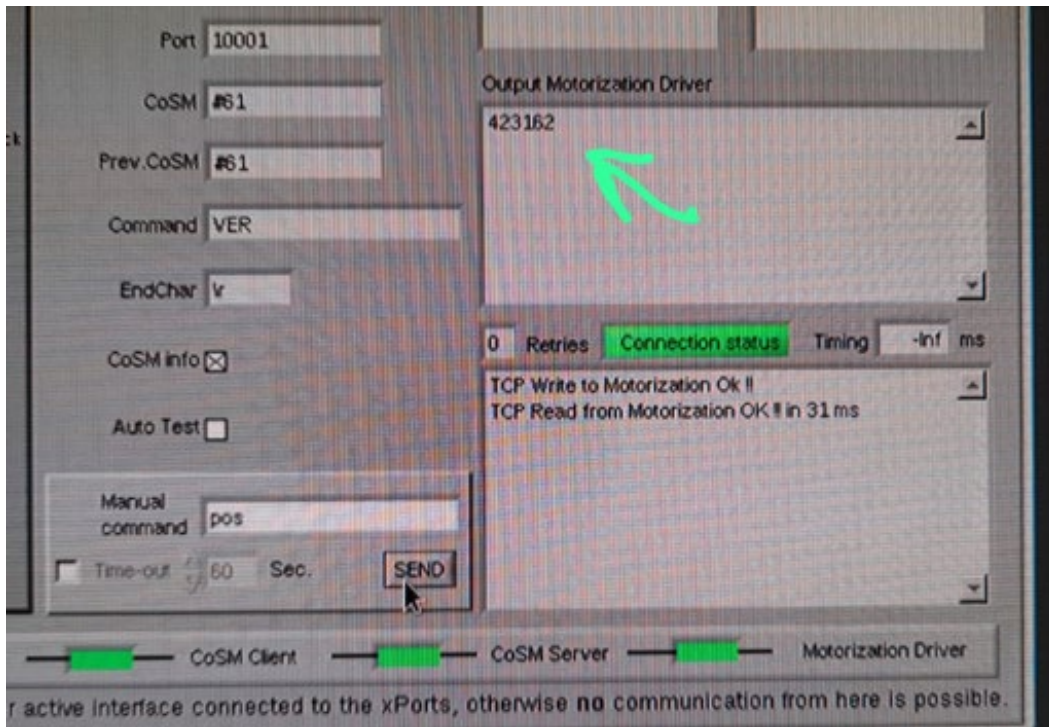
Picture 3 - SMS Com. Tool

- Select the motor that needs to be disconnected and click on the "Test" (vertical) button. The bottom communication indicators should all be green, the connection status, too.



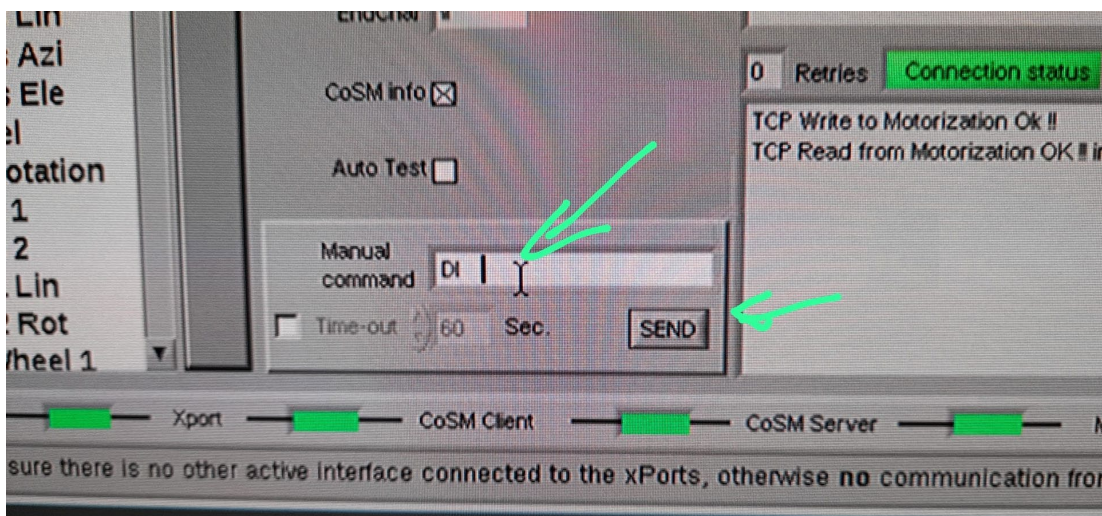
Picture 5 - M3 selection

- Test the communication with the driver of the motor, by writing the command: "POS", in the "Manual command" text control, then click the "SEND" button. The motor position should appear at the "Output motorization driver" text indicator, If the connection is OK; all is green. (see arrow)



Picture 6 - Motor position

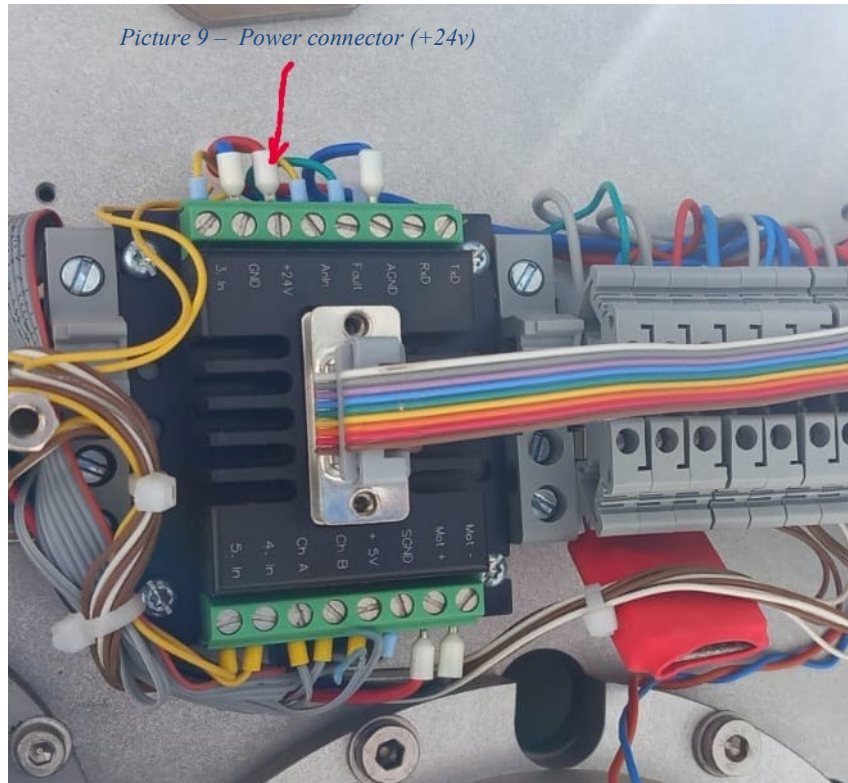
- Now, it is necessary to disable the motor before any disconnection. For the purpose, the command "DI" has to be executed, as same as last command: enter it in the "Manual command" text control and click the "SEND" button. The action **deactivates the driver power of the motor**, letting it free.



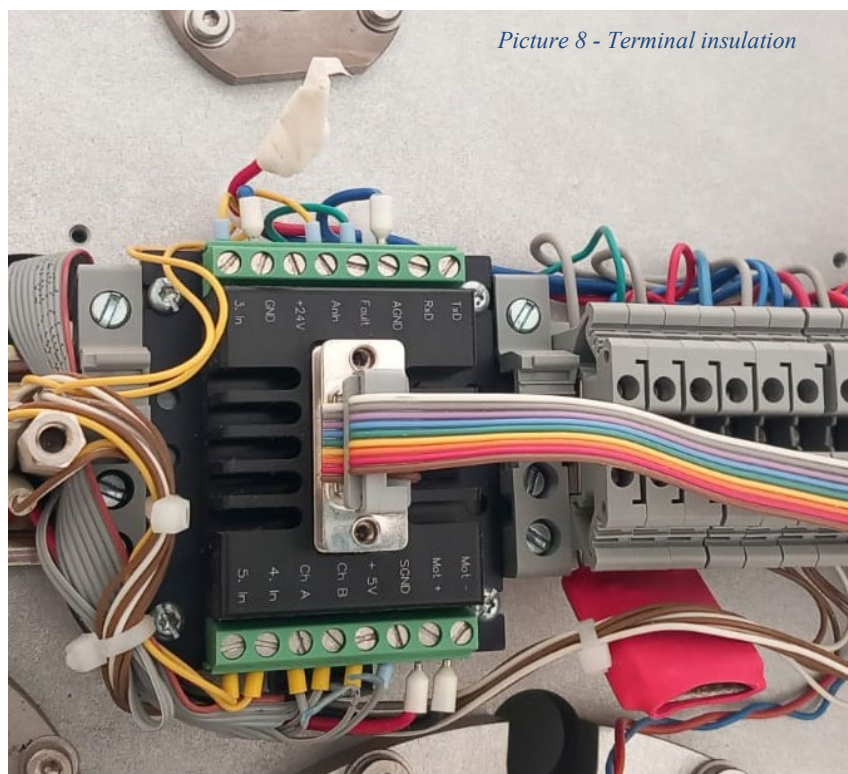
Picture 7 - Disable command

- Close the SMS Tool interface.

7. At the driver location, for more security, it power cable (+24v) has to be disconnected carefully without touching any other metal parts and insulated with tape. Always use a protected screwdriver when working with live power...



Picture 9 – Power connector (+24v)



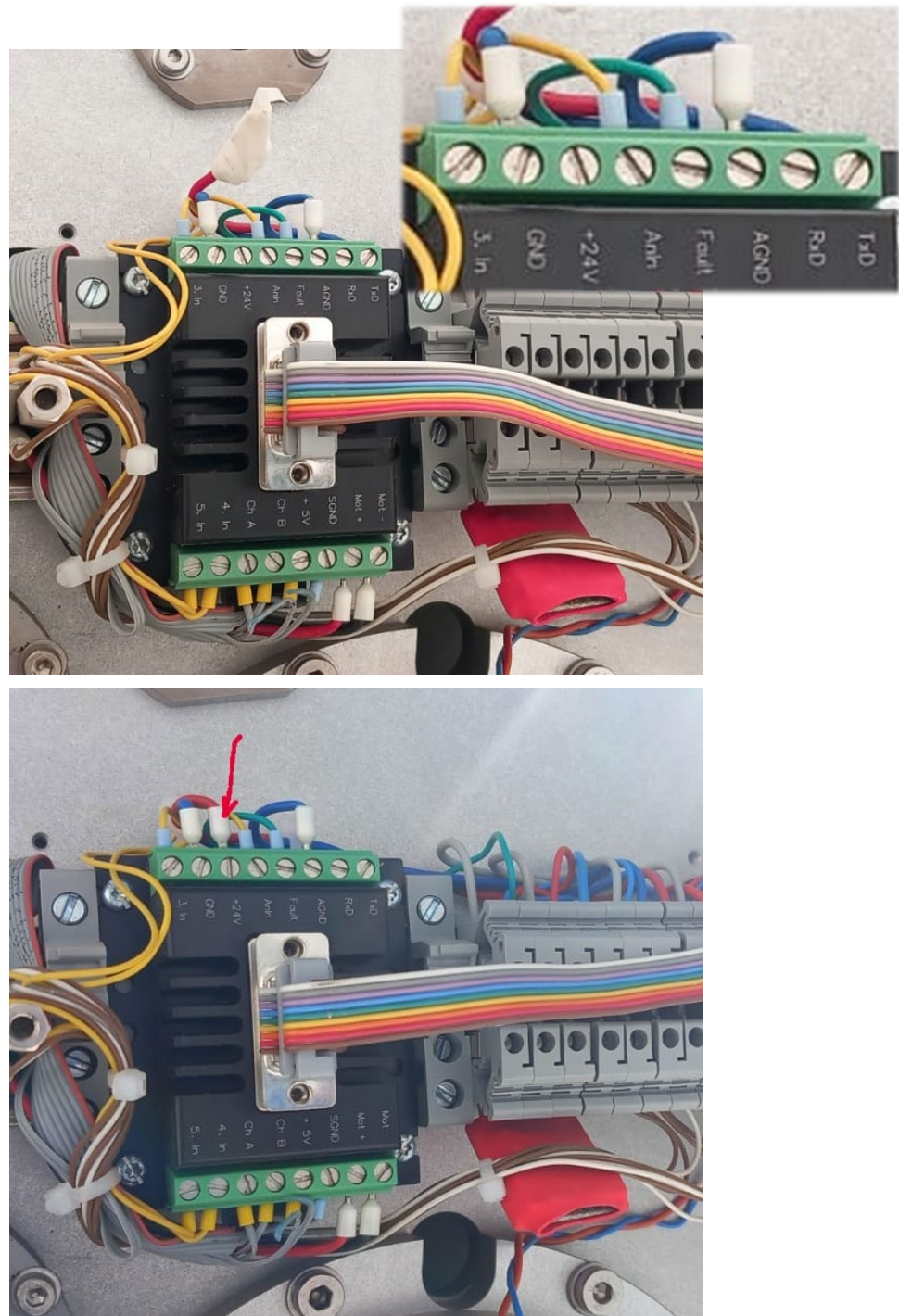
Picture 8 - Terminal insulation

8. Operation done! The motor cable can be disconnected securely.

## 5 Reconnection steps

In order to return to the previous state with the connected motor, the process is simpler and only requires a few steps to follow. Please, read entirely the instructions before proceeding:

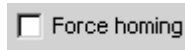
1. At the driver location, firstly reconnect the motor cable and verify the correct fixing of the connectors. Remove carefully the tape of the power cable (+24v) and remember it is a live power cable, avoiding any contact with other metallic parts around, to prevent damage of the hardware. Reconnect the cable exactly where it was, at the +24v of the driver.





2. Close the driver box and verify that the motor can move freely without any mechanical interference.
3. At the GCS computer, restart the motorization interface which hosts the motor.
4. Verify that the "Force homing" is **NOT** enabled.

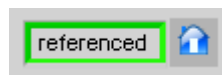
*The control should be like this:*



Execute a "Smart homing" of the motorization. As the power has been removed and set again, the driver of the disconnected motor has lost its configuration parameters. Starting the referencing operation will reestablish inside the parameters and the motorization will move mechanically...



5. Check that the referencing of all motors of the interface has conclude successfully.



**Done!**