

GEMÜ 1282

Controller for GEMÜ servoDrive actuators

EN

Installation manual



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1 LED displays



LED conditions							
●	lit (on)	~	irrelevant	☀	flashes	○	off

"DS" LED codes

The **DS** LED is the actuator LED and is identical for all bus system types.

LED state		Meaning
Off	○	The actuator amplifier does not have a supply voltage or the actuator is faulty.
Flashing green	☀	The actuator amplifier is in functional state but output stage is disabled.
Flashing red	☀	The actuator amplifier is in error state and output stage is disabled.
Flashing yellow	☀	The actuator amplifier is in warning state and output stage is disabled.
Flashing yellow, green	☀	The actuator amplifier is in warning state and the output stage is enabled.
Lit up green	●	The actuator amplifier is in functional state and the output stage is enabled.
Flashing red, green	☀	The actuator amplifier is in firmware update state.

"MS" LED codes

Ethernet/IP: The **MS** LED indicates the module state.

LED state		Meaning
Off	○	The bus module does not have a supply voltage or is faulty.
Flashing green, red, green	☀	The bus module is performing its power-on test.
Flashing green	☀	Standby: The bus module is not configured (for example, no network cable is connected).
Flashing red	☀	The bus module is in an error state but the error can be reset.
Lit up red	●	The bus module is in an error state and the error cannot be reset. Restart the actuator.

LED state		Meaning
Lit up green	●	The bus module is functioning faultlessly.

"NS" LED codes

Ethernet/IP: The **NS** LED indicates the fieldbus state.

LED state		Meaning
Off	○	The bus module does not have an IP address (or does not have a supply voltage or is faulty).
Flashing green, red, off	◐	The bus module is performing its power-on test.
Flashing green	◑	An IP address is configured but there is no active CIP connection.
Flashing red	◒	An IP address is configured but a time out has occurred.
Lit up red	●	The bus module has recognized that its IP address is already being used
Lit up green	●	The bus has an IP address and there is at least one active CIP connection (no time out).

2 Electrical installation

NOTICE

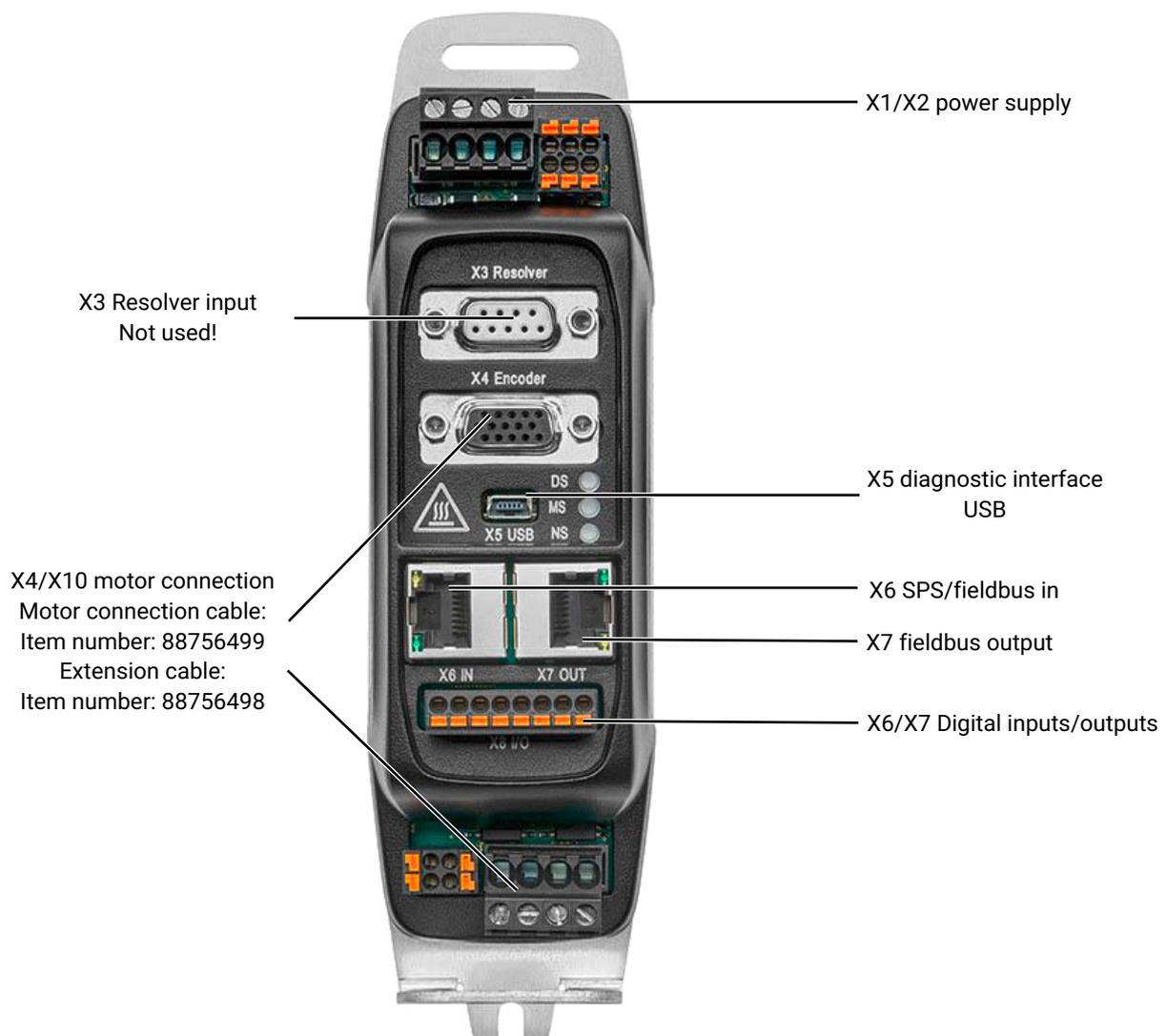
► The controller can be operated using the ProfiNET, EtherCAT or Ethernet/IP communication interfaces. The factory setting is ProfiNET. The communication interface can be changed via a software update.

2.1 Controller with protection class IP65



1. Connecting the motor:
 - ⇒ Connect the actuator to connection **X8**. Make sure that the dot on the plug is pointing outwards.
2. Connect the power supply.
 - ⇒ Connect the power supply unit cable to connection **X1**. The dot on the plug should be facing inwards.
3. The controller should be initially commissioned either via a network cable or USB cable:
 - ⇒ *Connection via network (TCP/IP communication):* Connect the M12 plug of the network cable (green cable) to the **X3** controller and the RJ45 network plug to the computer.
 - ⇒ **Note:** If no network interface is available, a USB network adapter can be used.
 - ⇒ *Connection via USB communication:* Connect the M12 plug of the USB cable to the **X4** controller and connect the USB connector to the computer.
4. Switch on the power supply unit.
5. Check whether the controller is supplied with power. The LEDs on the controller light up or flash.

2.2 Controller with protection class IP20

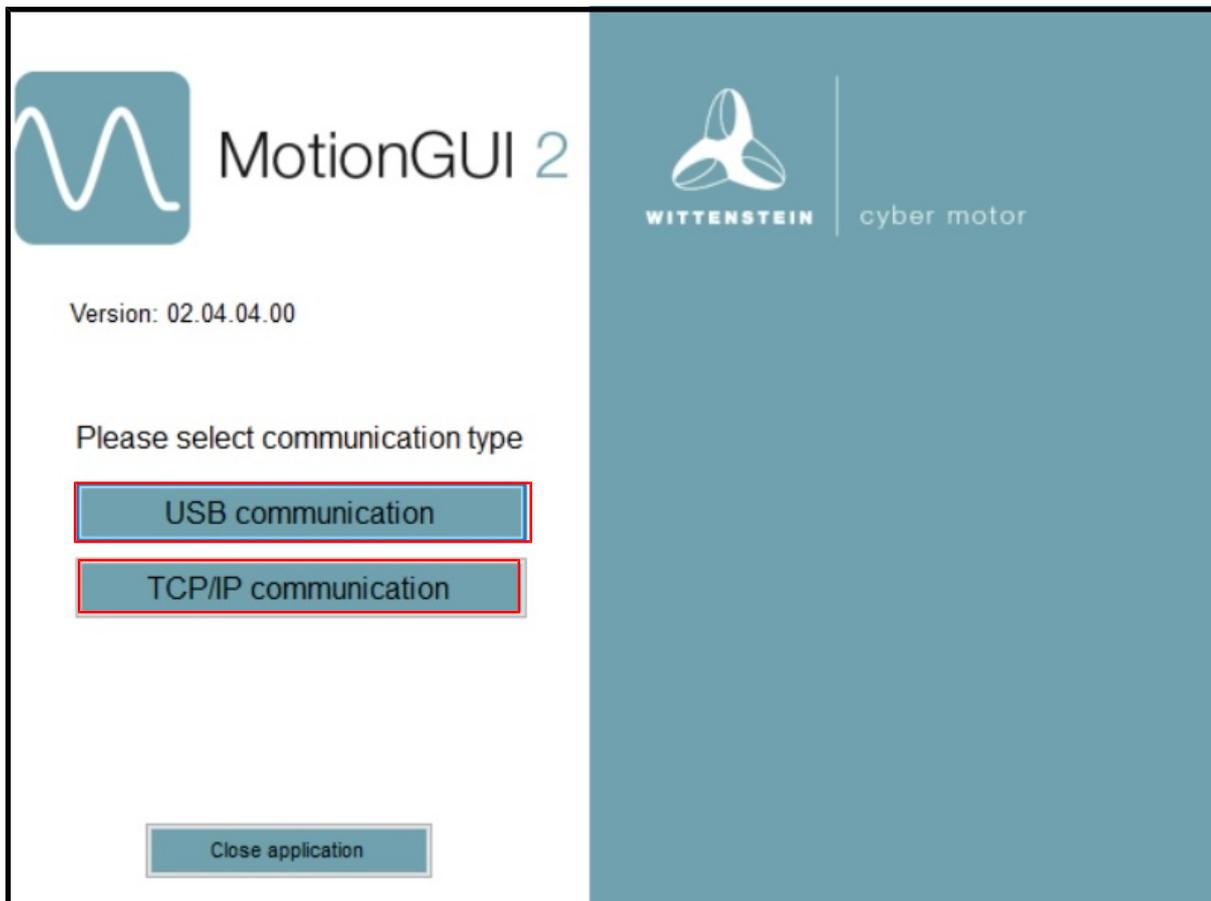


1. Connecting the motor:
 - ⇒ Connect the actuator to connections **X4** and **X10** via the motor connection cable.
2. Connect the power supply.
 - ⇒ Connect the power supply units to connections X1 and X2 .
 - ⇒ The controller should be initially commissioned either via a network cable or USB cable.
 - ⇒ Connection via network (TCP/IP communication): Connect the X6 connection on the controller to the network interface on the PC using a standard network cable.
 - ⇒ **Note:** If no network interface is available, a USB network adapter can be used.
 - ⇒ Connection via USB communication: Connect the X5 connection on the controller to the USB interface on the PC using a standard USB cable with a USB mini connector.
3. Switch on the power supply unit.
4. Check whether the controller is supplied with power. The LEDs on the controller light up or flash.

3 MotionGUI 2 software

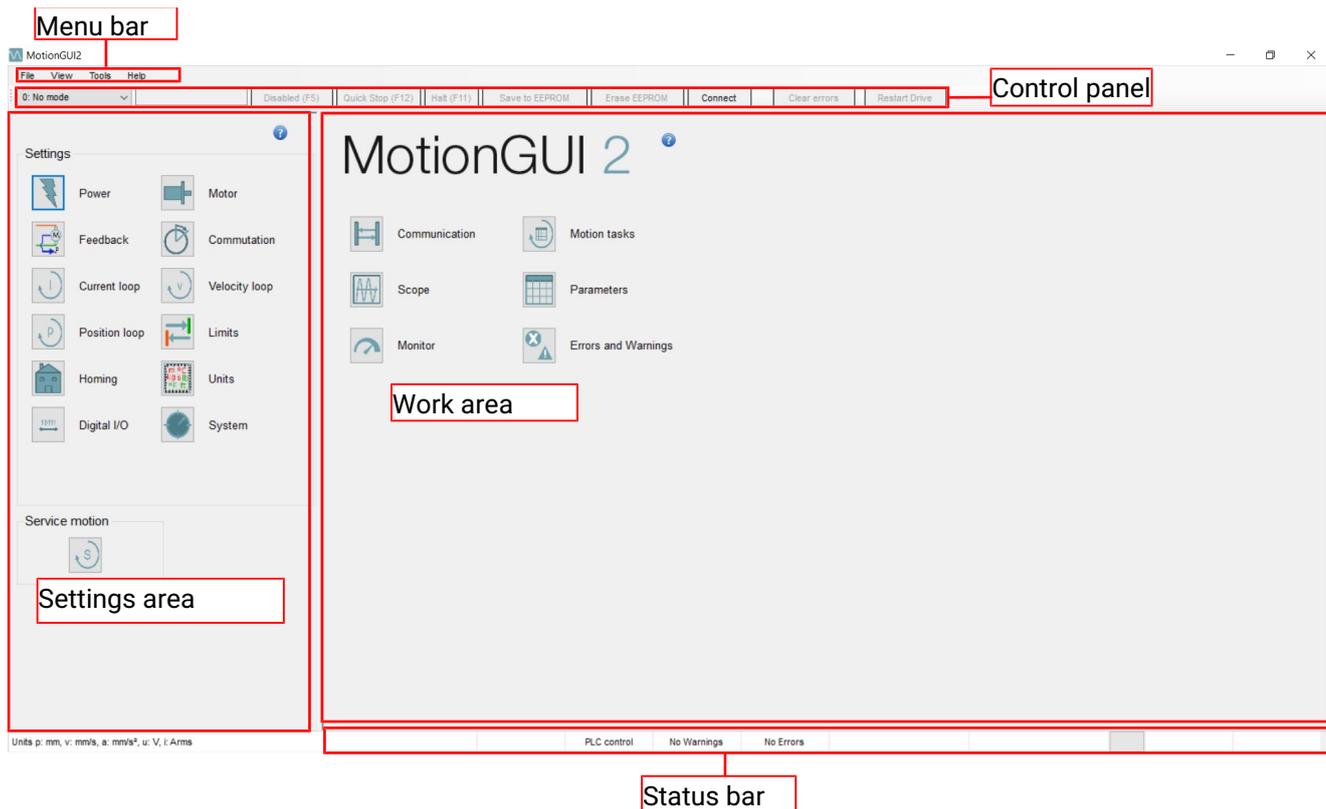
3.1 Starting software/selecting connection type

1. The link for downloading the MotionGUI 2 software can be obtained from your GEMÜ contact person. Please download the software and install it for commissioning.
2. Start the MotionGUI 2 software.



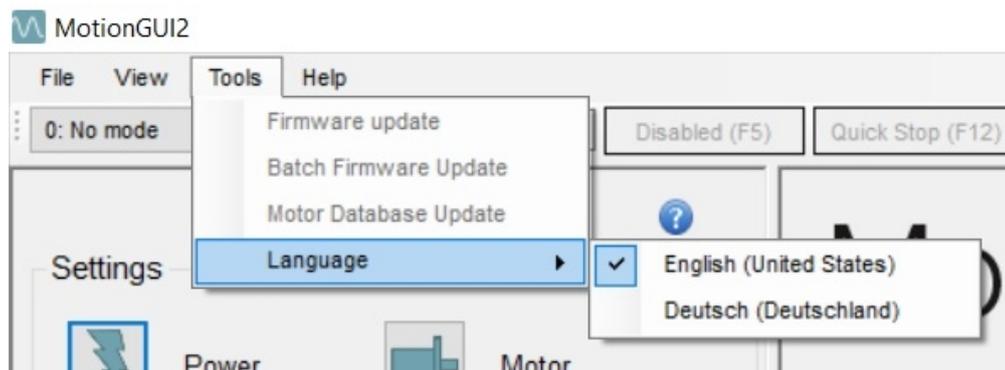
3. Select the communication interface
 - ⇒ USB communication (USB cable) **or**
 - ⇒ TCP/IP communication (network cable)

3.2 Design of the software



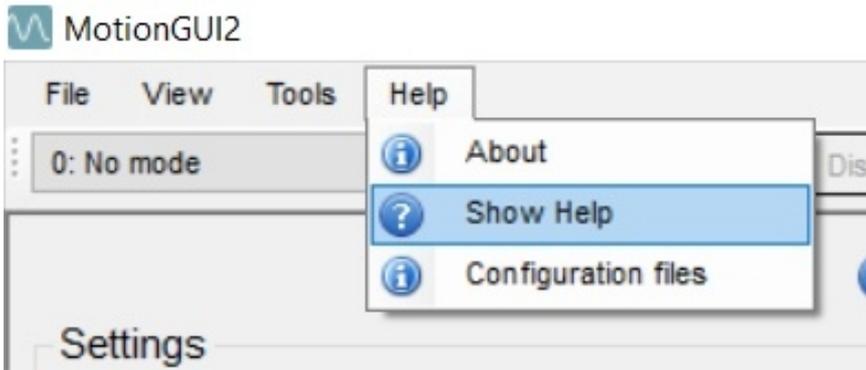
Work areas	Function
Menu bar	Basic functions of the software
Control panel	Fast access to important and frequently used functions
Settings range	Determining actuator settings
Work area	Monitoring and controlling the main functions
Status bar	Shows the status of the actuator and the communication connection

3.3 Setting language



1. The language is adjustable via the menu bar.
 - ⇒ Extras → Language or
 - ⇒ Tools → Language
2. Select language (German or English)

3.4 Help and instructions



The MotionGUI 2 software also provides help and instructions. Select "**Help**" in the menu bar and then "Display help". The software program help will open.

Under the "Configuration files" item in the "**Help**" menu bar, the configuration files for the relevant controller are provided for connection to PLC systems.

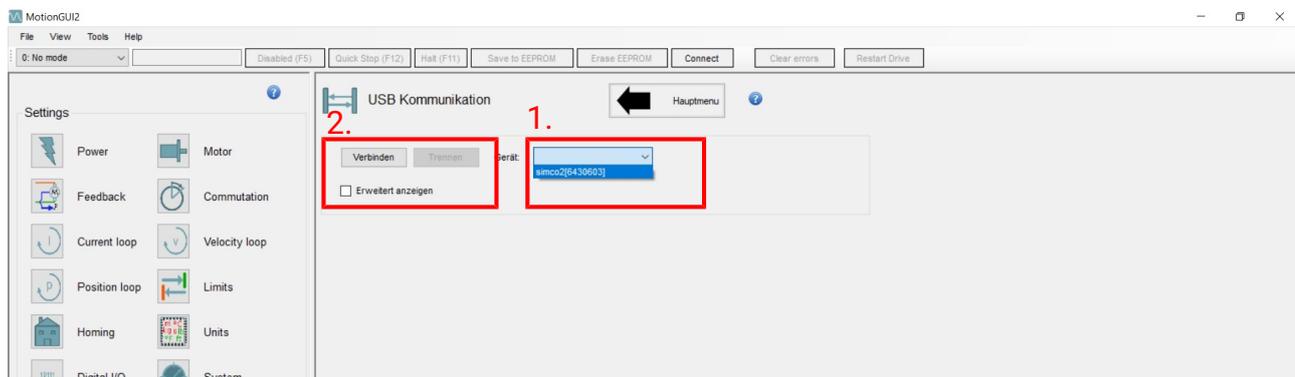
3.5 Establishing the connection to simco® controller

After starting the software and selecting the connection type, the communication view will open in MotionGUI 2 in the work area, to establish the connection to the simco® controller.

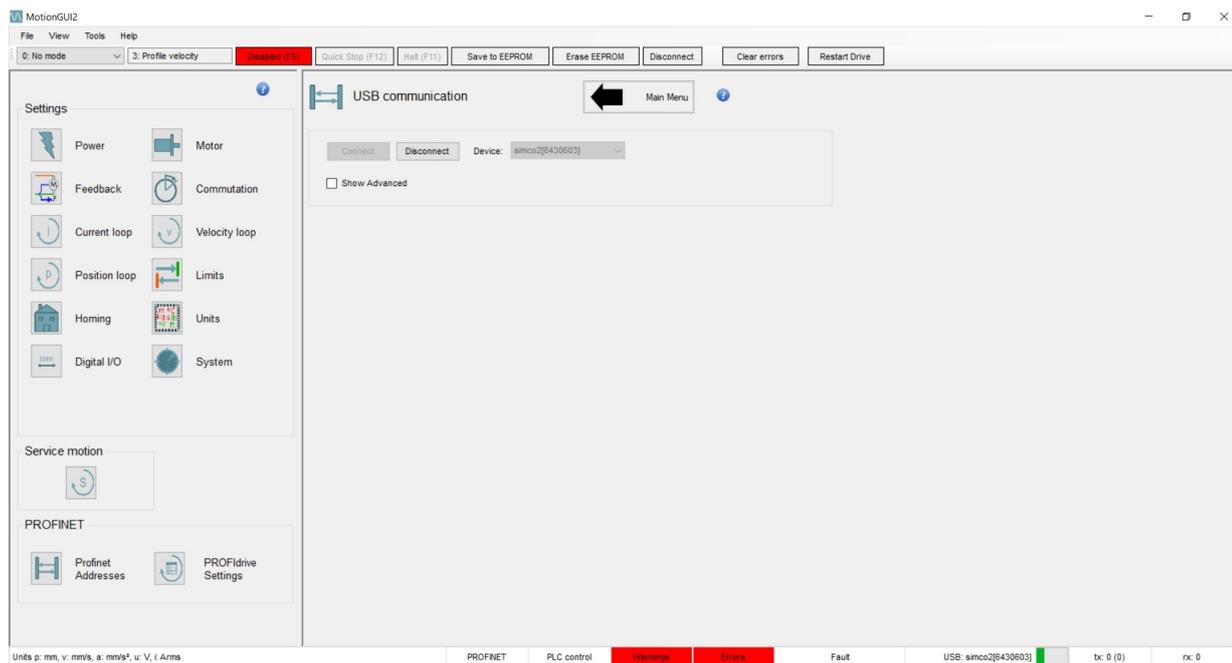
1. USB communication (see Chapter 3.5.1, page 8).
2. Connection via network (ProfiNet, EtherNet/IP and Sercos) (see "TCP/IP communication", page 10).

3.5.1 USB communication

After starting the software and selecting the "**USB communication**" connection type, the communication view will open in the work area, to establish the connection to the simco controller.



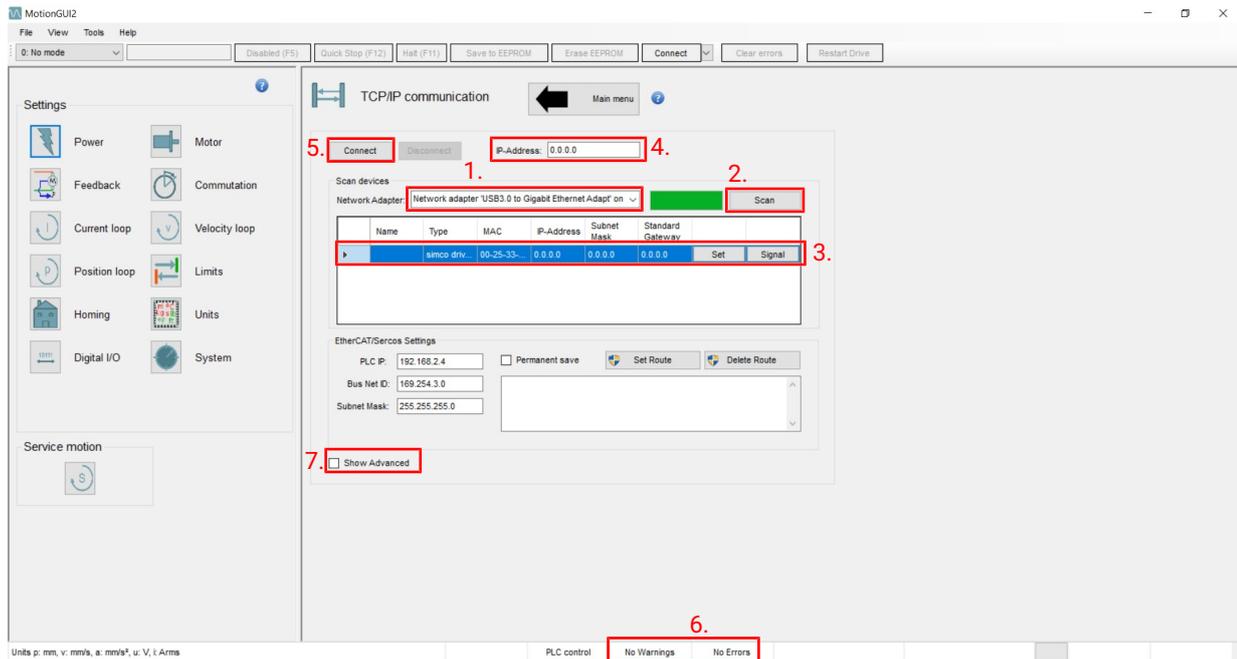
1. Select the simco controller using the pull-down menu.
2. Under "**Device**" 1 select the correct simco controller and press Connect 2.
3. USB communication is established once the screen below is displayed.



4. When a connection is established, the warning and error fields in the status bar will light up red or green.
5. The bus that has been set (communication interface) in controller 1282 is automatically recognized.
6. Follow the next steps (see “Checking software versions, carrying out an update and selecting the fieldbus system”, page 11).

3.5.2 TCP/IP communication

After starting the software and selecting the "TCP/IP communication" connection type, the communication view will open in the work area, to establish the connection to the simco controller.

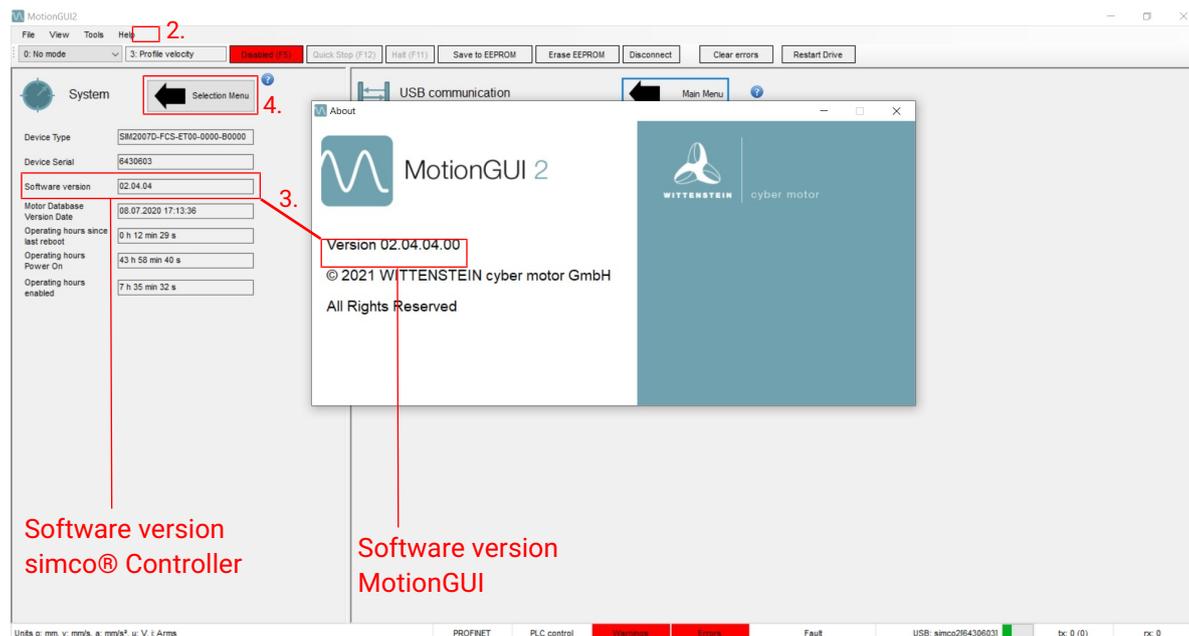


NOTICE

► If the IP settings are already known, points 1–3 can be skipped.

1. If there are several network connections/network adapters, select the adapter **1** connected to the simco® controller.
2. Press the "Scan" **2** key.
3. All available/connected simco® controllers are shown in the list **3**.
4. The computer IP address **4** and the controller IP address must be in the same IP address area.
 - ⇒ The IP settings of the simco controller can also be changed in the list.
5. Establish the connection by pressing the "Connect" **5** key.
6. Check the power supply.
 - ⇒ Power supply OK: The "No warnings" and "No errors" **6** fields are lit up green.
 - ⇒ Power supply faulty: The "No warnings" and "No errors" **6** fields are lit up red.
7. Further data can be shown by ticking the "Display expanded" **7** box.

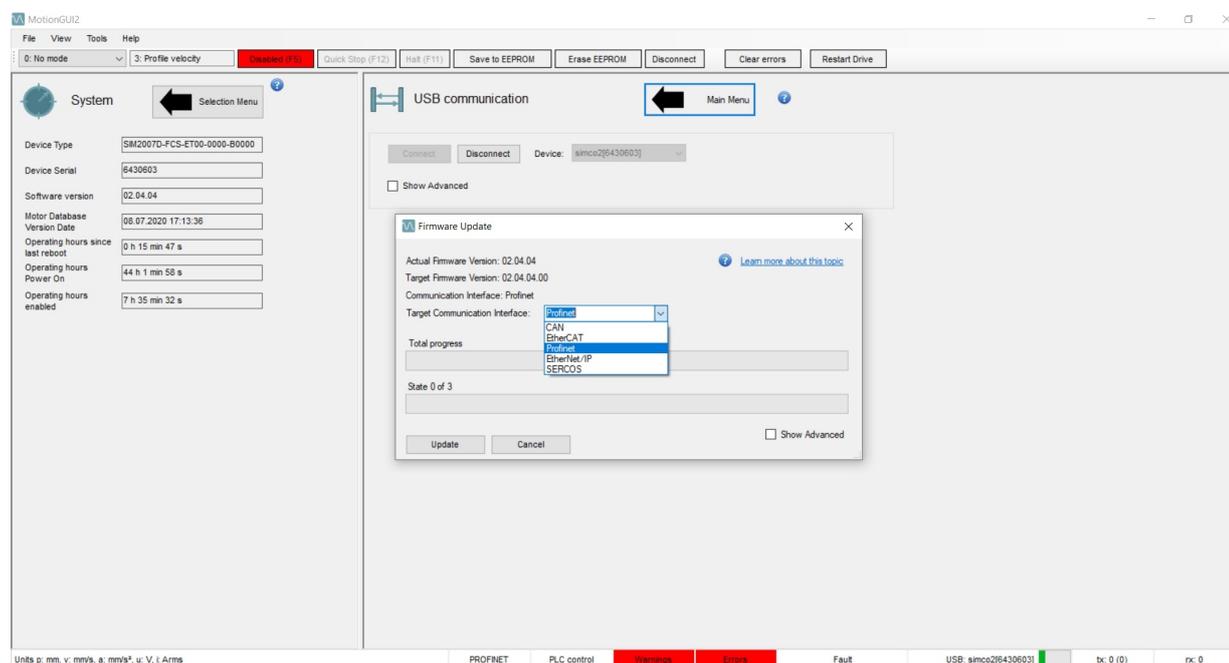
3.6 Checking software versions, carrying out an update and selecting the fieldbus system



Software version
simco® Controller

Software version
MotionGUI

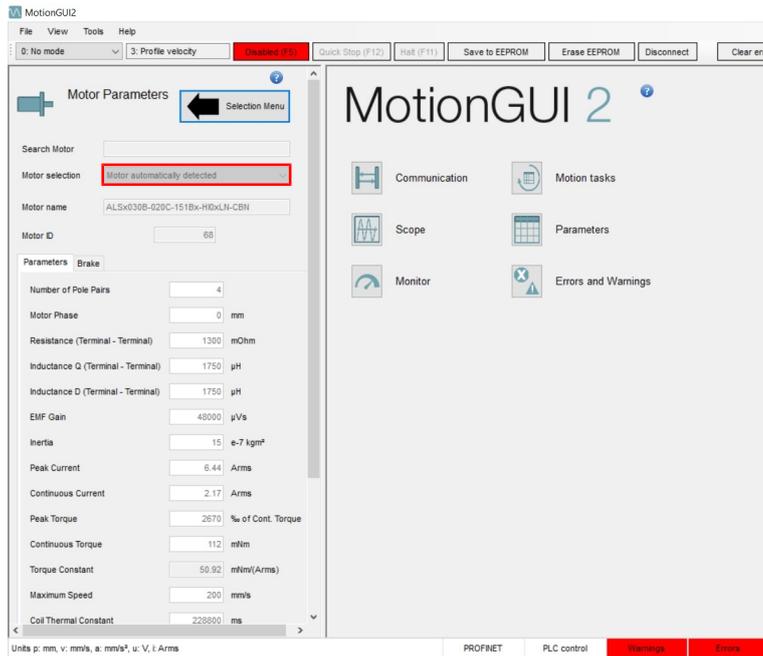
1. Click the "**System**" key in the settings area
 - ⇒ The system data for the simco controller is displayed
2. Call up MotionGUI 2 software version via the menu bar "**Help**", "**About**"
3. Check whether the firmware version of the simco controller and the software version of MotionGUI 2 are identical.
 - ⇒ If the versions are not identical, update the firmware via the menu bar "**Extras**", "**Firmware update**".



4. The product is delivered from the factory with the ProfiNET fieldbus interface. The communication can also be changed to ETHERCAT or Ethernet/IP via a software update.
5. The preferred fieldbus interface can be set or changed under the "**Firmware update**" item in the "**Extras**" menu bar.
6. The preferred bus can be selected from the pull-down menu under Target Communication.
 - ⇒ The bus can then be changed by pressing the "**Download**" key
7. After the update, go back to the settings area by pressing the "Selection menu" key (with an arrow).

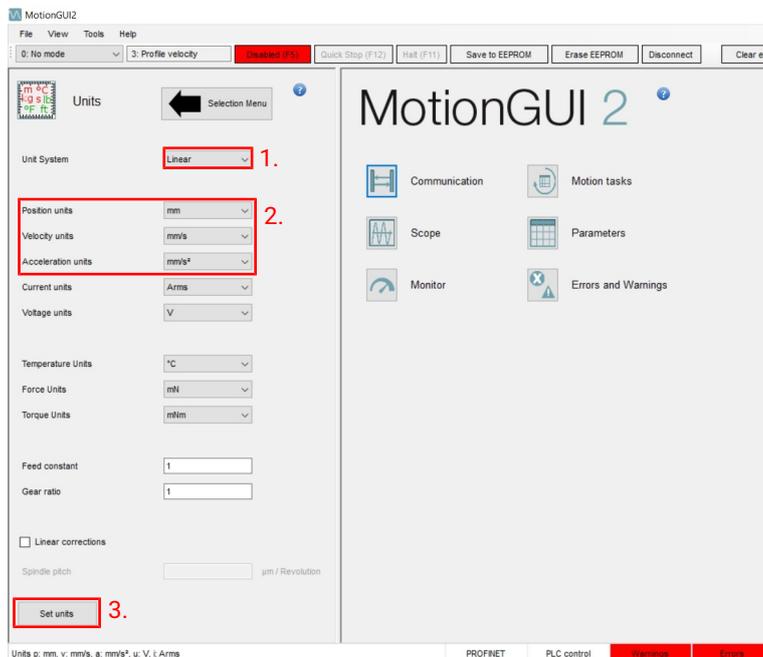
4 Initial setting and initialization (homing)

4.1 Motor



1. Select the **"Motor"** key in the settings area.
 - ⇒ The motor should be automatically recognized and "Motor automatically recognized" is displayed in the motor selection field.
2. If the motor is not recognized, update the motor database again.
 - ⇒ The database can be updated via the menu bar **"Extras"**, **"Motor Database Update"**.
3. Press the **"Selection menu"** key (with an arrow) to return to the selection menu.

4.2 Units



1. Select the **"Units"** key in the settings area.
 - ⇒ If the motor has been correctly recognized, "Linear" is displayed for the unit system 1.
2. Use the following units 2:
 - ⇒ Position unit: mm

- ⇒ Rotational speed unit: mm/s
 - ⇒ Acceleration unit: mm/s²
3. For other displayed units (rotary or counts), these must be amended and confirmed by pressing the "**Set units**" key 3.
 4. Press the "Selection menu" key (with an arrow) to return to the selection menu.

4.3 Permanently saving settings



The controller has two different storage areas:

- RAM (working memory); settings and motion tasks stored here are only available during operation and are lost when the controller is switched off.
 - EEPROM (permanent memory); settings and motion tasks stored here are permanently saved. Upon starting the actuator, the settings and motion tasks from the EEPROM are automatically loaded into the RAM.
- Press the "**Selection menu**" key (with an arrow) to return to the selection menu.

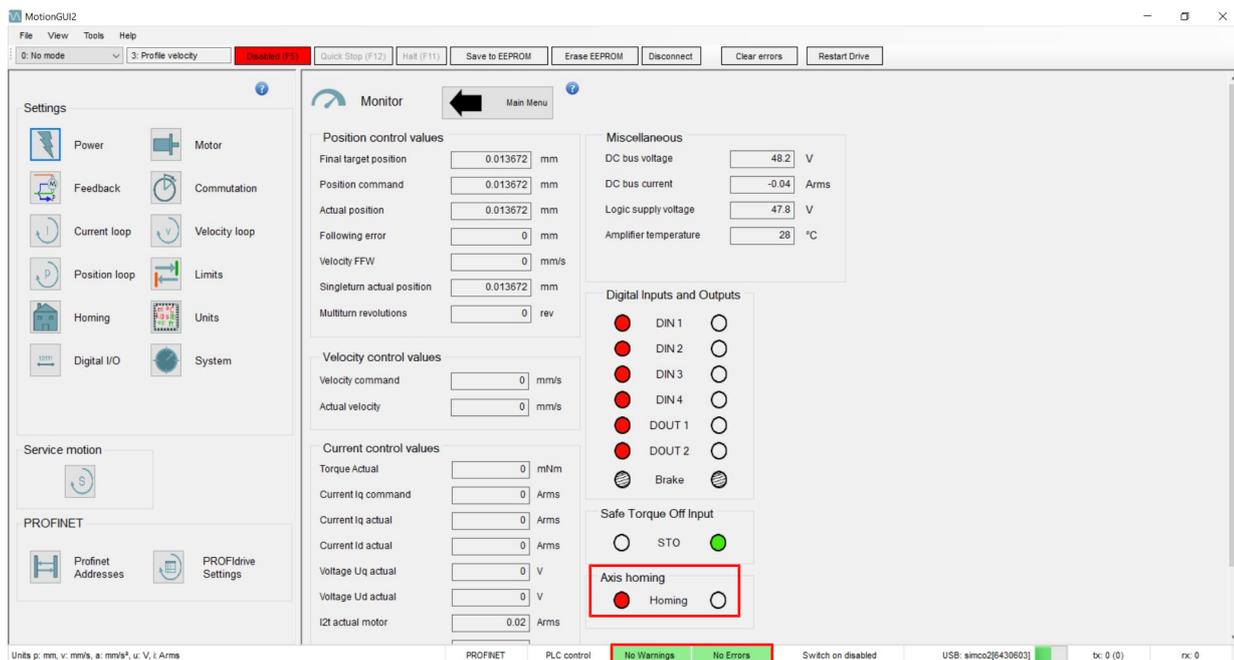
NOTICE

Important note

- ▶ Configured settings, e.g. changed limit values or settings for digital inputs and outputs, are initially only saved in the RAM. To save these permanently, you must press "Save in EEPROM" button on the control panel.

4.4 Checking status/monitor window

1. Select the "Monitor" key in the work area.



If homing has still not been carried out, the dot next to "Axis homing" will turn red and the engine will not run. An error message may occur upon initial installation of a new actuator. This can be found in the status bar.

2. Errors or warnings are then displayed highlighted in red.

3. Acknowledge errors and warnings.

⇒ No errors present: The "No warnings" and "No errors" fields are highlighted in green.

4.4.1 Acknowledgement of warnings and errors

Acknowledge errors and warnings in the following ways:

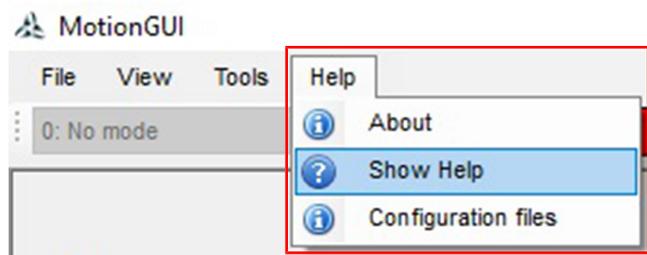
1. Right-click on the error or the warning in the status bar and then click on "Clear errors" or "Clear warnings".

2. Click on the error or the warning in the status bar.

⇒ The view changes to errors and warnings in the work area. Here, all errors and warnings can be viewed and acknowledged.

3. Click on the "Clear error" button in the control panel.

A list of warnings and errors, as well as their CAN, ProfiNet, Ethernet/IP and Sercos parameters, is outlined in the help area of MotionGUI software.



4. Select "Help" in the menu bar and then "Display help".

⇒ The program help will open.

5. Under "MotionGUI" -> "Main work area" -> "Errors and warnings", the errors and warnings are listed in English.

4.4.2 Checking and entering the current limit

1. Select the "Limit values" key in the settings area.

2. In the "User-dependent current limit" field of the "Current limits" area, enter the value "2.1" Arm and confirm by pressing enter.

3. Press the "Selection menu" key (with an arrow) to return to the selection menu.

The screenshot displays the MotionGUI 2 software interface. The main window is titled "MotionGUI 2" and features a sidebar on the left with the heading "Grenzwerte" (Limits). The sidebar contains several sections of adjustable parameters:

- Positionallimits:**
 - Positionsbereich Max: 0 mm
 - Positionsbereich Min: 0 mm
 - Schleppfehlerfenster: 0.5 mm
 - Softwareendschalter Reaktion: DIF
 - Softwareendschalter Max: 65535.999999 mm
 - Softwareendschalter Min: -65536 mm
- Drehzahllimits:**
 - Maximale Profidrehzahl: 100.0041 mm/s
 - Nutzerabhängige Überdrehzahl: 185.8333 mm/s
 - Maximale Motordrehzahl: 200 mm/s
 - Maximale Geberdrehzahl: 1000 mm/s
 - Wirksames Drehzahllimit: 186.0041 mm/s
- Beschleunigungslimits:**
 - Maximale Beschleunigung: 30517.5701 mm/s²
 - Maximale Verzögerung: 30517.5701 mm/s²
- Drehmomentlimits:**
 - Nutzerabhängiges Drehmomentlimit: 960 mNm
 - Maximales Motordrehmoment: 299 mNm
 - Wirksames Drehmomentlimit: 119 mNm
- Stromlimits:**
 - Nutzerabhängiges Stromlimit: 2.1 Arms
 - Maximaler Motorstrom: 6.44 Arms
 - Maximaler Verstärkerstrom: 15 Arms
 - Wirksames Stromlimit: 2.1 Arms

The main area of the interface shows the "MotionGUI 2" logo and a grid of icons for "Kommunikation", "Motion tasks", "Oszilloskop", "Parameter", "Monitor", and "Fehler und Warnungen". At the bottom, a status bar indicates "PROFINET", "PLC control", "Keine Warnungen", "Keine Fehler", "Operation enabled", "TCP/IP: 192.168.2.2", "bc: 0 (0)", and "rx: 0".

4.5 Initialization (homing)

NOTICE

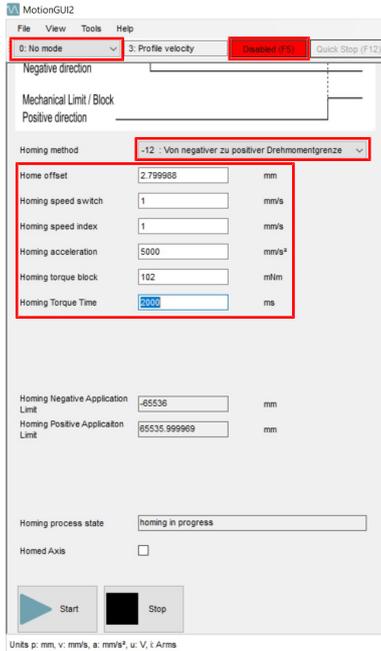
Please note

- ▶ When changing values, the background colour of the input field changes to yellow. You must confirm the changed value by pressing the Enter key.

NOTICE

Please note

- ▶ During homing, the valve will leave the end positions. Homing should therefore only be performed when the system is secure.



1. Select the "Homing" key in the settings area
2. Select "-12 From negative to positive torque limit" as the "Homing type"
3. Enter the following data:

Homing offset	Mounting size/Nominal sizes
2.8 mm for GEMÜ F60 servoDrive	Mounting size 1 (DN8–DN10)
6.0 mm for GEMÜ F60 servoDrive	Mounting size 3 (DN10–DN20)
8.0 mm for GEMÜ F60 servoDrive	Mounting size 4 (DN20–DN25)
9.0 mm for GEMÜ 567 servoDrive	(all nominal sizes)

4. Confirm by pressing enter.
5. Speed for switch search: 1 mm/s – confirm by pressing enter.
6. Speed for index search: 1 mm/s² – confirm by pressing enter.
7. Homing block with torque: 102 mNm – confirm by pressing enter.
8. Homing reference duration: 100 ms – confirm by pressing enter.
9. In the left-hand field of the control panel, change the operating mode to "6: Homing".
 - ⇒ The third field from the left on the control panel must be "Deactivated" and then reactivated by clicking it again.
10. Start homing by clicking on the start symbol
 - ⇒ If the homing was successful, the colour of the "Referencing axis" in the monitor work area will change from red to green.
11. Once the homing is completed, reset the operating mode to "1: Profile position" in the left-hand field of the control panel. This is only possible when the system is deactivated.

5 Motion tasks

NOTICE

- Where necessary, GEMÜ can provide an example motion task or assist with the creation of motion tasks appropriate for the application.

1. Press "Motion tasks" key in the work area.

In this work area, motion tasks can be

- Created
- Saved
- Opened
- Transmitted to the actuator
- Read out from the actuator
- Started
- Stopped

5.1 Creating motion tasks

The screenshot shows the MotionGUI2 software interface. The 'Motion tasks' window is active, displaying a table with columns for 'No.', 'Command', and 'Parameter'. The table contains several rows of motion tasks, including 'MoveAbsolute' and 'WaitTime'. The control panel on the right includes buttons for 'Write to drive' (2), 'Start' (3), 'Stop' (4), and 'Read from drive' (5). The 'Save' button (1) is highlighted in the top bar. The 'Load' button (6) is also highlighted. The interface includes various settings and status indicators at the bottom.

1. Create the motion task.
2. Select a command.
 - ⇒ Enter values, depending on the command (p = position, v = speed, a = acceleration, d = braking acceleration, next = the next command to be performed)
3. Transmit the command to the actuator.
 - ⇒ Click on the **"Write to actuator"** key to save the motion task to the RAM of the actuator
4. The motion task can be started by pressing the **"Start"** (arrow) key.
5. The motion task can be stopped by pressing the **"Stop"** (square) key.
6. Pressing the **"Read from actuator"** key means that the motion task saved to the RAM of the actuator can be inputted again.
7. Clicking on the **"Save"** key means that the created motion task can be saved to the PC and inputted again by pressing the **"Open"** key.
8. To permanently save the motion task to the non-volatile EEPROM memory, click **"Save to EEPROM"** on the control panel.

NOTICE

- Tasks can only be saved to EEPROM when the motor is switched off. To do this, press the **"Deactivate"** key on the control panel. For more detailed information about the two memory types, see Section 4.3.

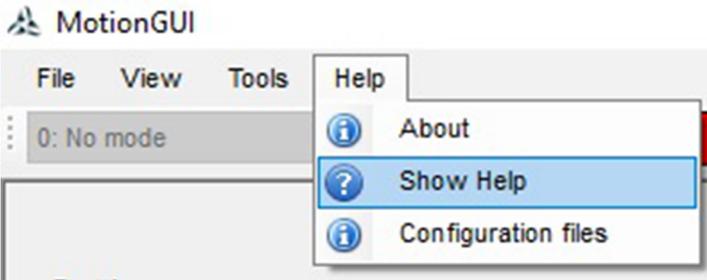
NOTICE

- ▶ Should errors or warnings occur, the "MAX software limit switch" limit value must be corrected under some circumstances.
- Click on the red warning field in the status bar to switch to the errors and warnings area.
- Evaluate the error and determine the original position.
- Enter the determined position as the "**Limit value**" in the settings area under "**MAX software limit switch**".
- Transmit the motion task to the actuator and test it.

⇒ In the event of a successful test, the limit value must still be saved permanently in EEPROM.

5.1.1 Instructions for creating motion tasks

More detailed information about creating motion tasks and the available instructions is given in the help area of the MotionGUI 2 software.



1. Select "**Help**" in the menu bar and then "**Display help**".
⇒ The program help will open
2. Under "**MotionGUI**" -> "**Main work area**" -> "**Motion Task**", the process of creating motion tasks and the individual run commands are described in English.

Motion Tasks

Units used in Motion Tasks

Motion Task editor overview

Context menu editing possibilities

Motion Task comment function

Motion Task using parameter instead of fixed numbers

Set Override

Motion Task example

Controlling Motion Tasks with digital inputs

Controlling Motion Tasks with SDO access

Motion Task command MoveAbs

Motion Task command MoveAbs

Motion Task command MoveRel

Motion Task command MoveRel

Motion Task Profile designer

Motion Task command WaitDigit

Motion Task command SetDigit

Motion Task command WaitTime

Motion Task command ChangeS

Units used in Motion Tasks

The motion parameter units used in Motion Tasks are defined in the menu Units in the Settings area (left part of the screen). The timeout parameter uses the unit milliseconds.

Set the units to the required units before starting programming Motion Tasks!

If the units need to be changed, store the Motion Tasks with the old units in the drive, change the units and read the Motion Task

[Go to TOP](#)

5.2 Opening and saving motion tasks

Created motion tasks can be saved on the computer via the "Save" key and input again via the "Open" key.

5.3 Transmitting motion tasks

NOTICE

- Description of both storage types, RAM and EEPROM (see "Permanently saving settings", page 13).

The following functions are available for transmitting motion tasks:

- "Writing to the actuator" key transmits the motion task for temporary operation currently positioned in the work area to the RAM of the actuator.
- "Reading from the actuator" key reads the current motion task from the RAM of the actuator.
- "Motion Task in EEPROM" key writes the current motion task from the RAM into the non-volatile EEPROM of the actuator.
- "Motion Task from EEPROM" key reads the motion tasks from the EEPROM and transmits these to the RAM.

NOTICE

- Settings for limit values and digital inputs and outputs only apply until the next restart of the controller. To permanently apply changed settings, these must be saved in the EEPROM of the controller (see "Permanently saving settings", page 13).

5.4 Performing and testing motion tasks

Motion tasks

Load Save

Idx	Command	Parameter
0	Idle	
1	MoveAbsolute	p 1 v 200 a 15000 d 15000 jx1000 0 profile trapez next 2
2	WaitTime	time [ms] 10 next 3
3	MoveAbsolute	p 43 v 200 a 15000 d 15000 jx1000 0 profile trapez next 4
4	WaitTime	time [ms] 10 next 1
5	Idle	
6	Idle	
7	Idle	
8	Idle	
9	Idle	
10	Idle	
11	Idle	
12	Idle	
13	Idle	

Task Nr. 0

Override 100 / 100 Set

Write to drive Read from drive

Motion Task to EEPROM Motion Task from EEPROM

Clear all motion tasks

Actual position 2.0816 mm

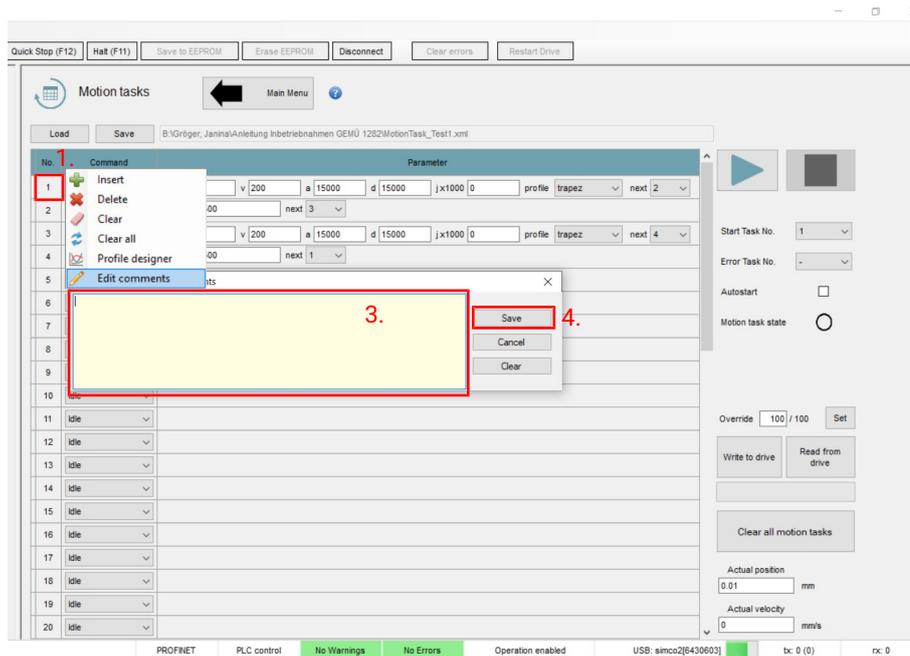
Actual velocity 0 mm/s

1. Transmit motion task to the RAM memory of the controller.
2. Select motion command via "Order no." field.
3. Motion task can be started with the "Start (arrow)" key.
4. Motion task can be stopped with the "Stop (square)" key.

NOTICE

- Should errors or warnings occur, the "Max. software limit switch" limit value must be corrected under some circumstances.
 - Click on the red warning field in the status bar to switch to the errors and warnings area.
 - Evaluate error and determine the original position.
 - Then enter the determined position in the setting range under limit values under "Max. software limit switch".
 - Transmit motion task to the actuator and test.
- ⇒ In the event of a successful test, the limit value must still be saved permanently in the EEPROM (see "Permanently saving settings", page 13).

5.4.1 Comments for motion tasks



As part of the documentation of motion tasks, every instruction and every line can have comments.

1. Right-click on the line number.
 - ⇒ The context menu will open.
2. Select "**Edit comments**".
3. Edit comments in the new window that opens.
4. Save changes by pressing the "**Save**" key.

NOTICE

- ▶ Created comments are only available on the PC and can only be saved on the PC with the motion tasks. The comments are not saved on the controller or EEPROM.

5.4.2 Profile Designer

In Profile Designer, a selected motion task is graphically shown as a curve progression and can be optimized in line with requirements. Profile Designer can be opened for each line with a motion task.

The screenshot shows the MotionGUI2 software interface. The main window displays a list of motion tasks (lines 1-20) and a 'Profile Designer' window for a selected task. The 'Profile Designer' window contains a graph showing position, velocity, and acceleration over time (ms). The graph shows a trapezoidal profile with a linear acceleration phase, a constant velocity phase, and a linear deceleration phase. The profile data table at the bottom of the window is highlighted with a red box and contains the following data:

Start position	Target position	Start velocity	Profile velocity	End velocity	Profile acceleration	Profile deceleration	Profile jerk	Profile type
mm	mm	mm/s	mm/s	mm/s	mm/s²	mm/s²	[1E3 crit/s³]	
0	2.8	0	200	0	15000	15000	0	Trapezoidal

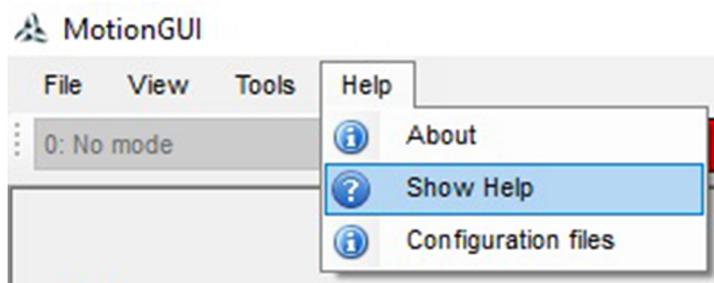
The 'Draw' and 'Update / Close' buttons are also highlighted with red boxes.

1. Right-click on the line number.
⇒ The context menu will open.
2. Select "Profile Designer" in the context menu.
3. Clicking on the "Draw" key will make the curve progression for the command appear.
4. In the "Profile data" section at the bottom, you can view and change the data that has been entered for the selected command
5. Clicking on "Update/Close" transfers the changed profile data from the Profile Designer to the command for the motion task.

6 Help and instructions

The MotionGUI software also provides help and instructions. Select "Help" and then "Show help" in the menu bar. Software programme help will open.

In the "Help" menu bar under the "Configuration files" item, the configuration files for CANopen, EtherCAT, EtherNet IP and ProfiNet are provided for connection to PLC systems.





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