

Motion Tool Schunk V2.11

MTS

Software manual

Imprint

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Reg. No. 003496 QM08



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1 General

1.1 About this manual

Illustrations in this manual are provided for basic understanding and may differ from the actual product design.

The following terms are used in this document:

- "Motion Tool Schunk (MTS)": Software
- "Schunk Motion Protocol (SMP)": SMP
- SCHUNK product: module

1.1.1 Applicable documents

- General terms of business *
- Software manual SMP *
- Documentation of the used modules *

The documents marked with an asterisk (*) can be downloaded on our homepage **www.schunk.com**.

1.2 System prerequisites

- Operating system: Windows 2000 and newer versions
- USB interface

NOTE

The USB driver is not supported by Windows versions older than 8, 8.1, 10.

Only valid for "MTS Config Tool"

- Microsoft .NET Framework 4.0

1.3 Supported languages

The following languages can be selected:

- German
- English

The language can be changed via the menu "settings - language".
The selected language is activated after restarting the system.

1.4 Communication interfaces

The software supports the following communication interfaces:

- Serial communication (COM ports)
- USB communication "SCHUNK USB driver"
- CAN: Cards from "Vector Informatik GmbH"
- CAN: Cards from "esd electronic system design GmbH"
- CAN: PCAN-USB converter from "PEAK-System Technik GmbH"
- CAN: Cards from "IXXAT Automation GmbH" (VCI V3 driver)
- CAN: Cards from "Softing AG"
- Profibus DPV0: Cards from "Hilscher" (preconfiguration required)
- Profibus DPV0: "Siemens AG" CP56xx controller series (preconfiguration required)

Please refer to the respective manufacturers for installation instructions.

1.5 Data throughput for CAN-Bus

The shortest time interval for the GET STATE command is reached using the CAN-Bus interface. Since the cycle time is 1 ms, the software displays every millisecond incoming messages.

2 Description

The software is a configuration and operating tool for modules with SMP.

The software can be opened with the DVD or directly on the computer. If you want to open the software directly on the computer, copy the "MTS" folder to a random directory.

NOTICE! The software must not be installed.

Recommended is a directory with write permissions for the user in order to save software settings.

After restarting the system, the following standard values for movements apply:

- Target speed
 - 10% of the maximum value
- Target acceleration
 - 10% of the maximum value
- Target pressure
 - 50% of the maximum value

If these values are changed, this change is only temporarily saved as long as the module is connected to the logic voltage. Is the logic voltage separated from the module and reconnected again, the module is always set back to these default values.

The module has either a CAN-Bus or a Profibus and in each case a USB interface.

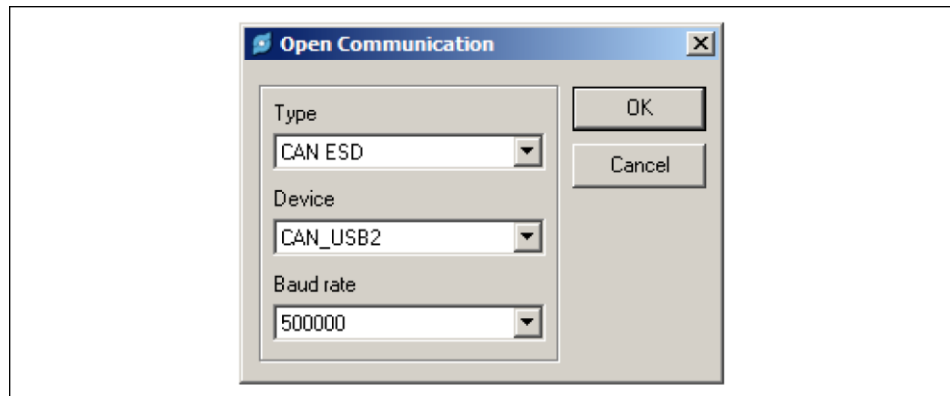
In order to communicate, the module can be connected to the computer via USB interface or via CAN-Bus or Profibus interface.


When opening the software, select the interface which will be used for communication.



NOTE

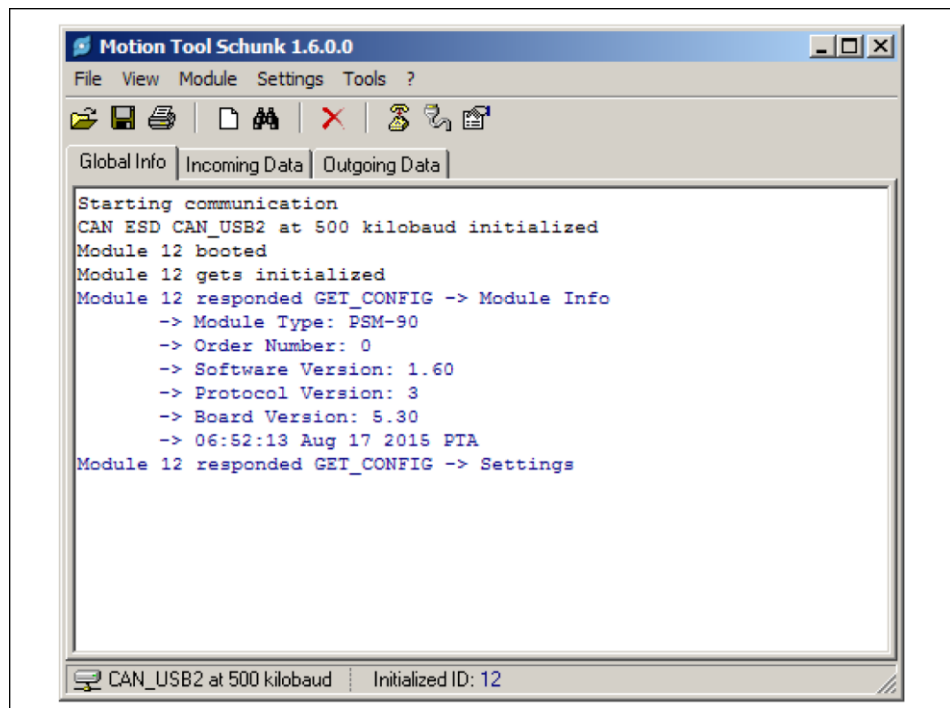
If the USB or bus cable is connected to the module, the respective bus connection is deactivated.

2.1 Communication



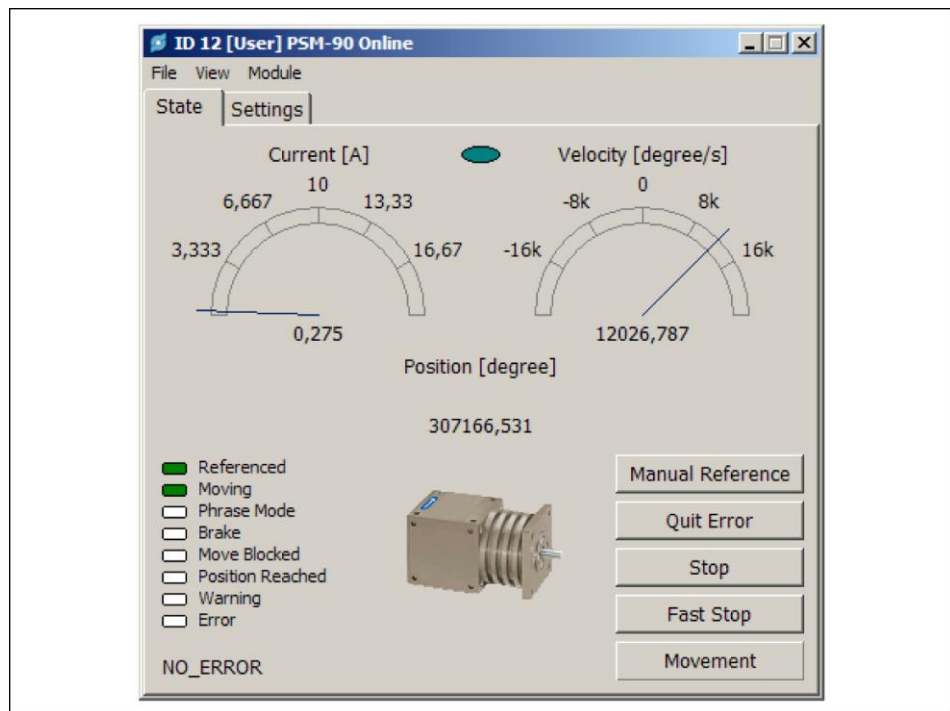
After selecting the communication interface via the  button, the window "open communication" is displayed.

All connected and switched-on modules are detected automatically by means of the bus search . If the "No automatic initialization of modules" option is activated under the "Basic settings", the module must be initialized manually . ([2.3, Page 13](#))



Program window

In addition to the program window, there is a module window for each detected module. With this window all functions of the respective module can be tested.



Module window

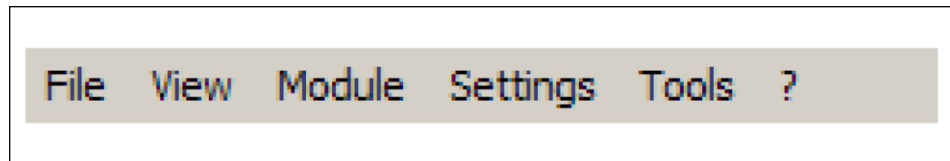
2.2 Program window

In the program window connections are managed, the communication on the active bus system is protocolled and application settings are processed.

The program window consists of:

- Menu bar ([2.2.1, Page 9](#))
- Tool bar ([2.2.2, Page 11](#))
- Output window ([2.2.3, Page 12](#))
- Status bar ([2.2.4, Page 12](#))

2.2.1 Menu bar

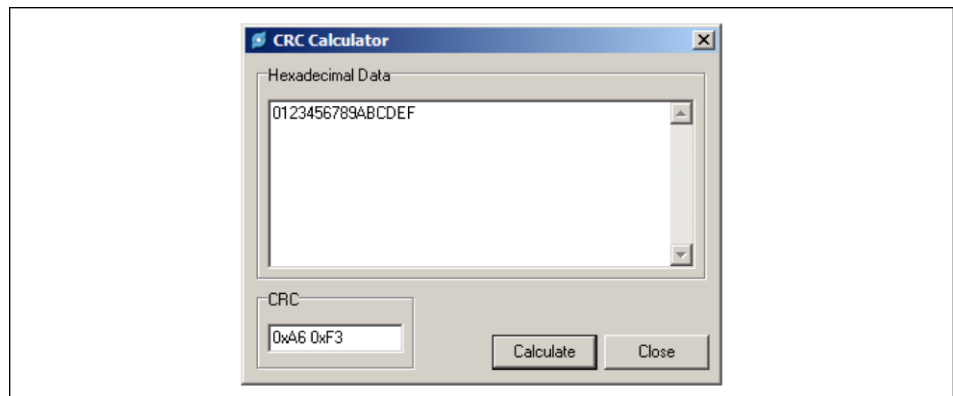


Menu bar

- File
 - Load: EEPROM configuration is imported from an available file.
 - Save: EEPROM content of all initialized modules is saved.
 - Print: EEPROM content of all initialized modules is printed.
 - Finish: Application is closed.
- View
 - Display bus details: A detailed report on the status of the bus system is displayed under "General information". To view a list of modules configured for Profibus, click on "Display bus details" in the program window under the "View" menu.
 - Set bookmark: A marker is set in the output windows.
 - Delete output data: The content of all output windows is deleted.
 - Module...: The view of the selected module is activated (module window).
- Module
 - Initialization with ID: Communication with a module is established which has a known ID.
 - De-initialization via ID: The communication with a module is interrupted.
 - Search bus: The entire bus is searched for active modules.
 - Find diagnosis: The entire bus is searched for diagnosis modules. Only activated, if there is an active serial interface (COM port).
 - All fast stop: The CMD FAST STOP command is sent to all modules.

- Settings
 - Establish communication: The set communication interface is opened or closed.
 - Open communication: A selected communication interface is opened.
 - Language: The current language of the software can be changed. The change of language applies after restarting the system.
 - Settings: Different Basic settings can be changed.
- Extras
 - CRC: The tool for calculating the CRC16 checksum is opened.
 - Number converter: The tool for converting different number formats is opened.
- ?
 - Help: Software help is opened.
 - In the help menu there is this document as well as the SMP software manual. The help menu can also be opened by pressing "F1".

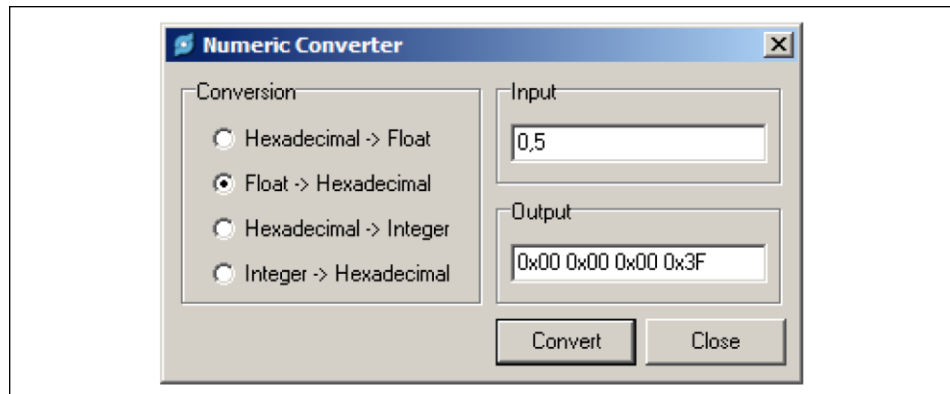
2.2.1.1 CRC Calculation



CRC Calculation

The "CRC Calculation" tool is used to calculate the CRC16 through previously entered hexadecimal numbers. This tool is designed for users communicating via a serial interface (COM port).

2.2.1.2 Number Converter



Number Converter

The "Number Converter" allows you to convert numbers into various formats.

2.2.2 Toolbar

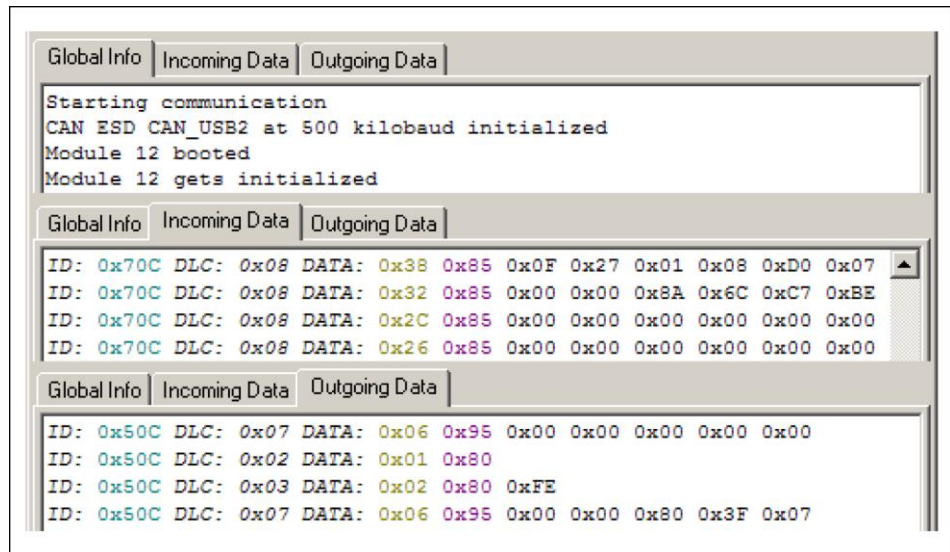


Toolbar

The toolbar helps to quickly address the most important functions.

	EEPROM content of all initialized modules is saved.
	EEPROM content of all initialized modules is printed.
	Module with a known ID is initialized.
	Entire communication interface is searched for active modules.
	"CMD FAST STOP" is sent to all modules.
	Set communication interface is opened or closed.
	Available communication interfaces are searched.
	Different Basic settings can be changed.

2.2.3 Output window



Output window

The "Global Info" tab displays all information regarding the connected modules.

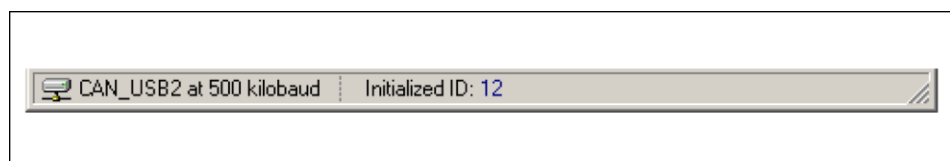
The "Incoming Data" tab displays all information regarding the data received from the module.

The "Outgoing Data" tab displays all information regarding the data sent by the module.

Incoming and outgoing data is useful for creating own applications. The sent byte sequence and the associated response from the module can be read.

All displayed data can be copied to other applications. The individual protocol elements are highlighted in color .

2.2.4 Status bar

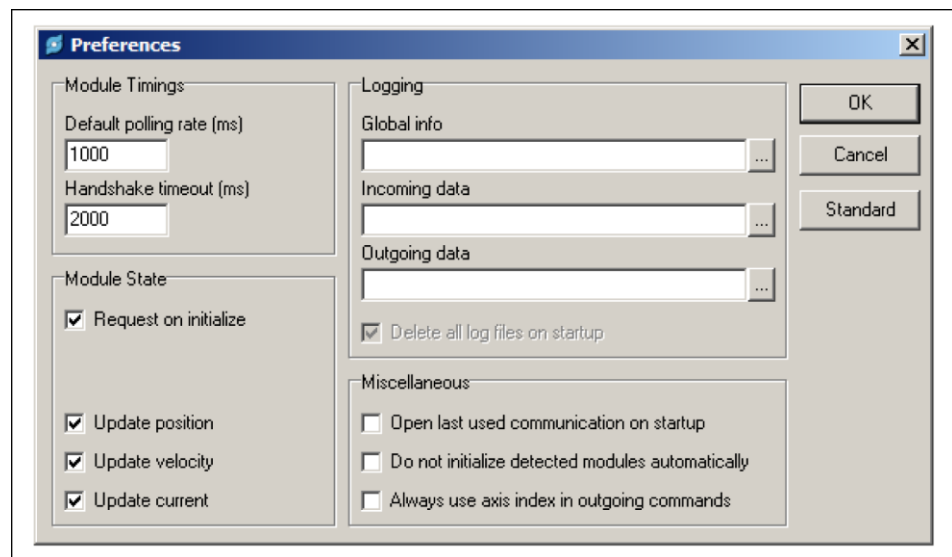


Status bar


The current communication properties are displayed in the Status bar.

- Status and settings of the communication interface.
- Number and ID of the initialized modules.

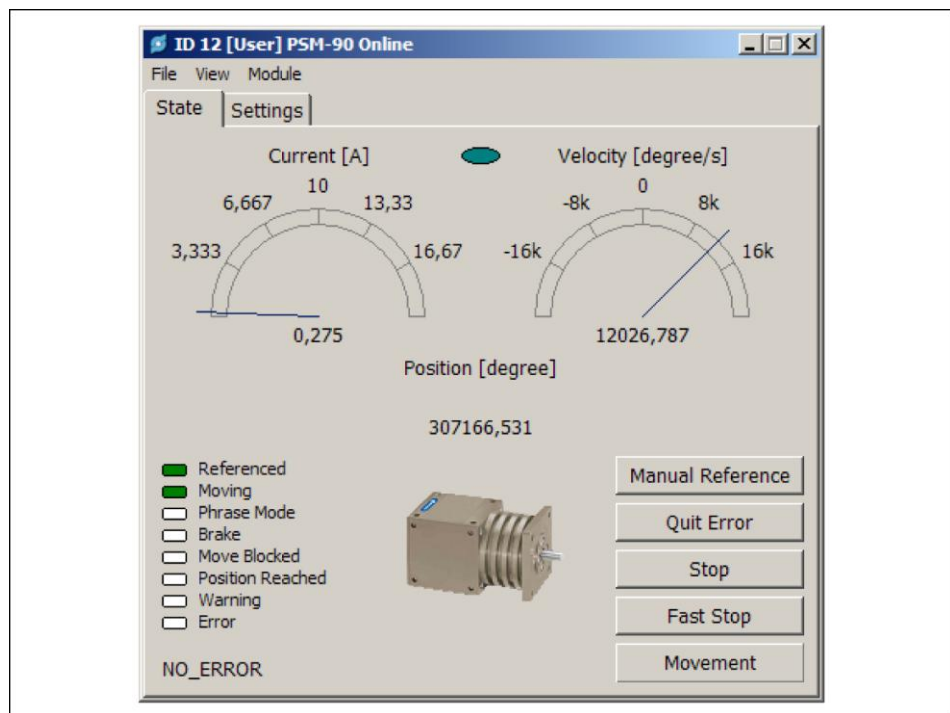
2.3 Settings



- **Module times**
 - **Standard time for request [ms]:**
If the box is ticked, a GET STATE with an adjusted cycle time is sent while initializing a module.
 - **Communication timeout (ms):**
Minimum time which the respective interface waits for a response from the module. After the time has passed and if no response has been received, a "Timeout" is generated.
- **Module status**
 - **Active after module initialization:**
If the box is ticked, a GET STATE is sent automatically after a module has been initialized.
 - **Update position:**
Position is requested with GET STATE.
 - **Update speed:**
Speed is requested with GET STATE.
 - **Update current:**
The current is requested with GET STATE .
- **Logging**
 - **Global info:**
Name of the file for saving the outputs is displayed under "Global Info".
 - **Incoming Data:**
Name of the file for saving the outputs is displayed under "Incoming Data".

- Outgoing Data:
Name of the file for saving the outputs is displayed under "Outgoing Data".
- Delete logging at start:
All previous logging is deleted when restarting the application.
- Miscellaneous
 - Open last communication interface when starting:
The communication setting used last is set during the restart, and communication will be started.
 - No automatic initialization of modules:
If a module is found via bus search, no module window is initialized. The module is only initialized manually .
 - All outgoing commands have axis index:
All commands sent to the module have the axis index in the message. This means that "0" is also sent if no axis index is defined.

2.4 Module window



Module window

In the module window, all data relevant to the module can be managed and individual commands can be sent to the respective module.

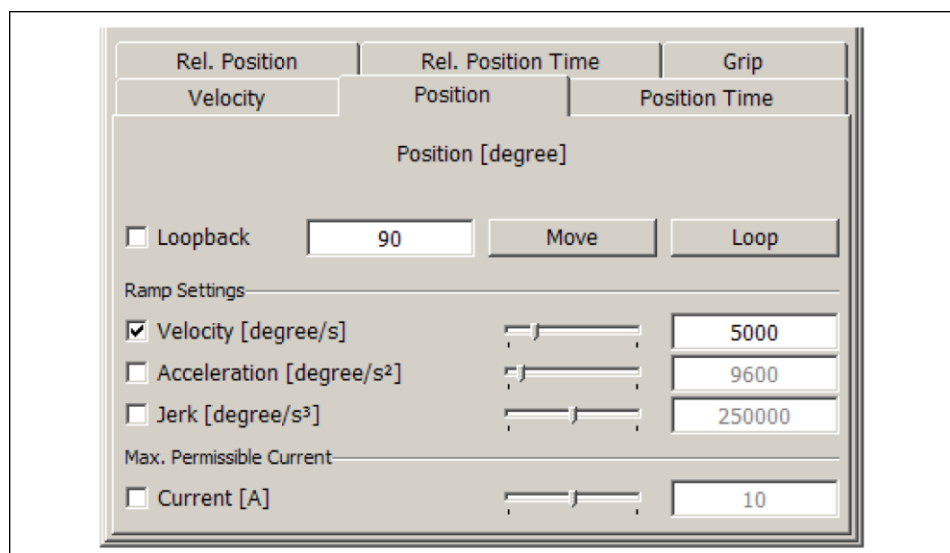
The module's current status is displayed under the "status" tab. The status display is updated with every incoming GET STATE message.

NOTE

If the status request is deactivated in the ([2.3, Page 13](#)), the display is not updated. When communicating via Profibus, however, the elements are updated with every message coming in from the module.

The title of the module window is displayed in the form: *<Modultyp> [<Benutzerrechte>] ID <Modul-ID> <Status (aktiv/inaktiv)>*. If there is no response on a command sent to the module, the status display changes from "active" to "inactive".

By using the function buttons, the most important commands can be sent directly to the module. Click on "Movement" to extent the window by the required parameterization of movement commands.



Movement commands

2.4.1 Module states

The following states can be displayed under "Status":

- Referenced
 - The module is referenced.
- Movement is running
 - The module moves at a speed greater than the parameterized movement threshold.
- Program sequence
 - The internal program is executed.
- Brake
 - The brake is activated.
- Was blocked
 - The status is activated, if:
 - the module is not moving or moves at a speed below the movement threshold,
 - the target current has been reached ($\pm 15\%$),and
 - the brake timeout has expired.
 - The status is deactivated, if:
 - a new movement command is triggered,
 - the target current is reset with the SET TARGET CURRENT command,or
 - the module restarts.
- Position reached
 - The target position is reached during a positioning movement.
- Warning
 - A warning occurred.
- Error
 - An error occurred.

2.4.2 Function buttons

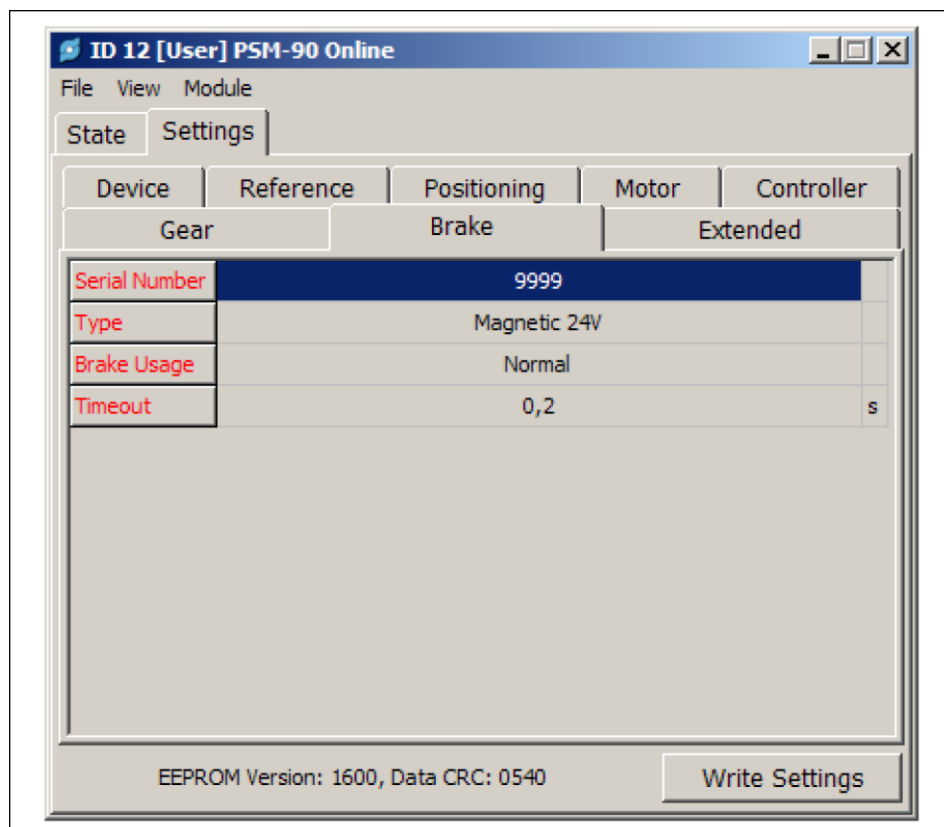
The following commands are available:

- Reference
 - Reference movement is executed or manual referencing is started.
- Acknowledge error
 - CMD ACK command is executed.
- Stop
 - CMD STOP command is sent to the module.
- Fast stop
 - CMD FAST STOP command is triggered.
- Movement
 - Window is extended by further control elements.

Movement commands

- Speed
 - Speed movement is executed.
- Position
 - Positioning movement is executed. If "Cycle" or "Loop" is activated, it can be moved between two freely selectable positions.
- Position time
 - Time-controlled positioning movement (curves possible) is executed. If "Cycle" or "Loop" is activated, it can be moved between two freely selectable positions.
- Rel. position
 - Relative positioning movement is executed. If Cycle or Loop is activated, two relative positioning movements are carried out alternately.
- Rel. position time
 - Time-controlled relative positioning movement is executed (curves are possible). If Cycle or Loop is activated, two relative positioning movements are carried out alternately.
- Grip
 - Gripping process is carried out.

2.4.3 Module parameters



Brake tab

The "Parameter" tab is available once the module configuration has been received.

The EEPROM entries can be read out and modified under the individual tabs of the "Parameter" tab. Depending on the corresponding user rights, some EEPROM entries are only enabled for reading.

3 Operation

The explanations on operating the software are based on Windows 7. In the following there is a description of the initial operation of the module and the communication via USB interface.

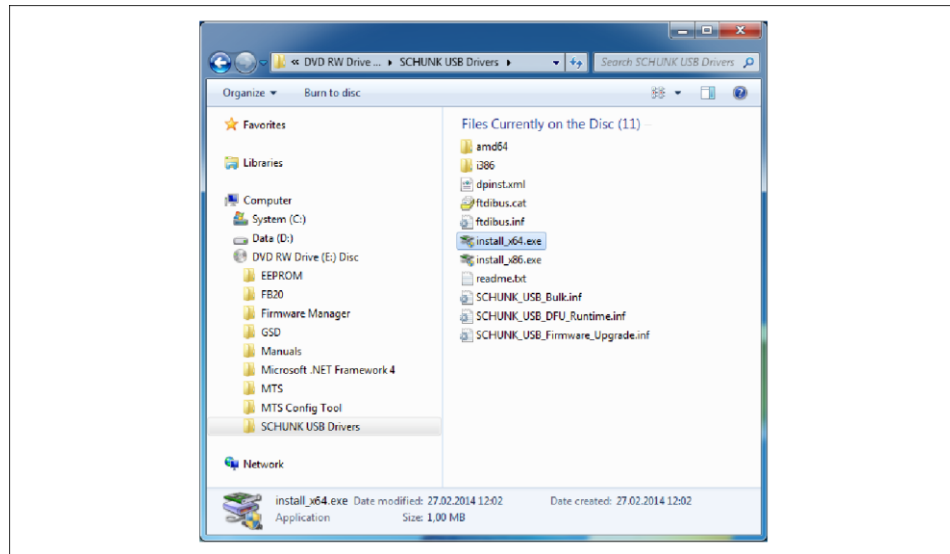
- ✓ Module and controller are connected mechanically and electrically.
- 1 Insert the CD contained in the scope of delivery and pre-install USB driver ([👉 3.1, Page 20](#)).
- 2 Connect module to the computer ([👉 3.2, Page 22](#)).
- 3 Open *Motion Tool Schunk (MTS)* via *mts-exe* ([👉 3.3, Page 22](#)).
- 4 Execute the first operation of the module via *Motion Tool Schunk (MTS)* ([👉 3.4, Page 24](#)).

3.1 Pre-install USB driver

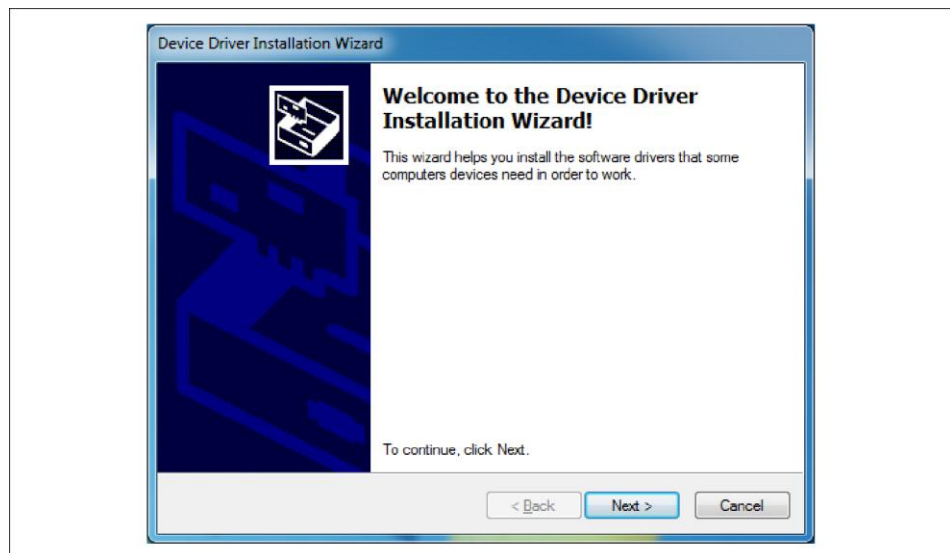
NOTE

The USB driver is pre-installed on the computer. If a new module is connected to the computer, this module's USB driver must be installed ([3.2, Page 22](#)).

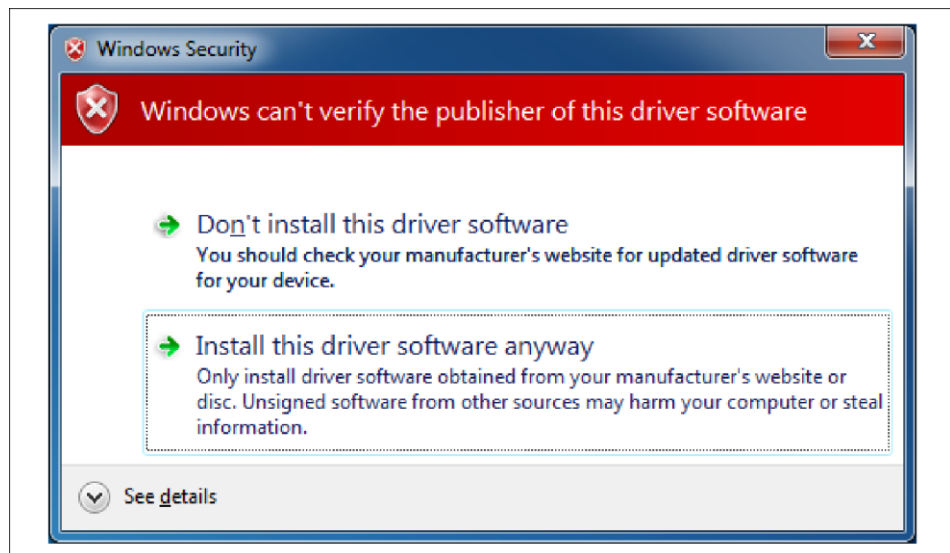
- 1 Insert the DVD included in the scope of delivery and select the "SCHUNK USB Drivers" directory.



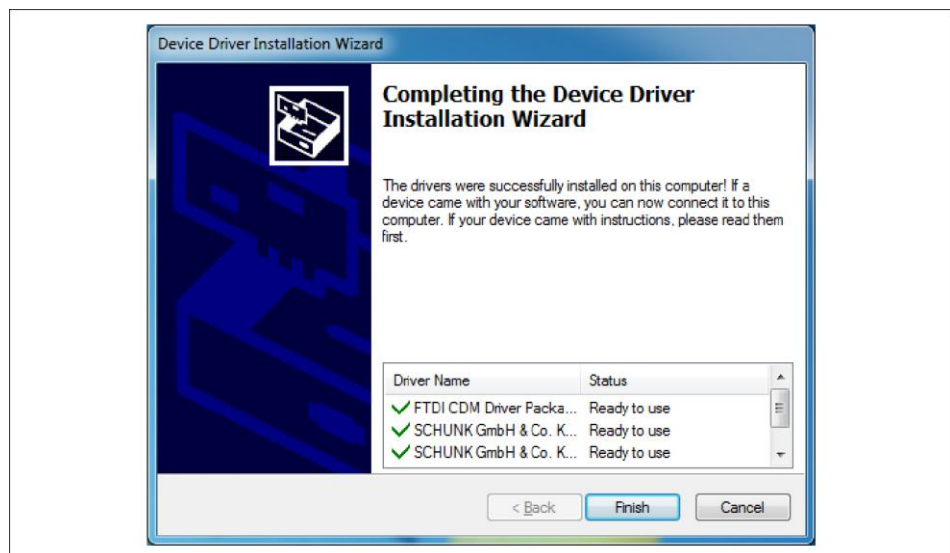
- 2 Execute the installation file.
 - ⇒ **For 64 bit systems:** install_x64.exe
 - ⇒ **For 32 bit systems:** install_x86.exe



- ⇒ The window "device driver installation wizard" is displayed.
- 3 Click on "Next".
 - ⇒ USB driver is pre-installed.



- 4 If the "Windows Security" window is displayed, select "Install this driver software anyway".



- ⇒ After the installation was successful, the "device driver installation wizard" window is displayed.
- 5 Click on "Finish".
- ⇒ The USB driver installation will be finished.

3.2 Connect module to the computer

NOTE

If a new module is connected to the computer, this module's USB driver must be installed .

- ✓ The USB driver is pre-installed on the computer.
- ✓ The voltage supply is connected to the module.

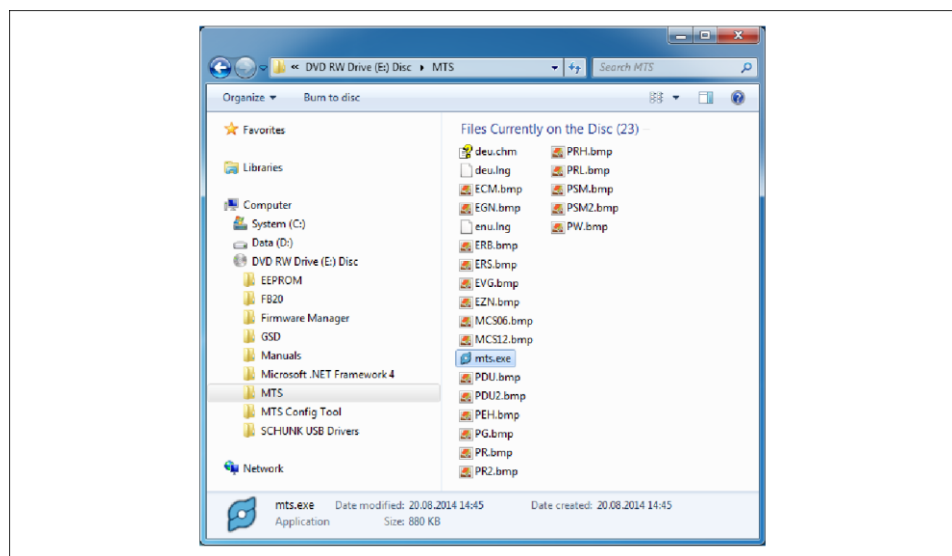
1 Connect module to the computer using the USB cable.



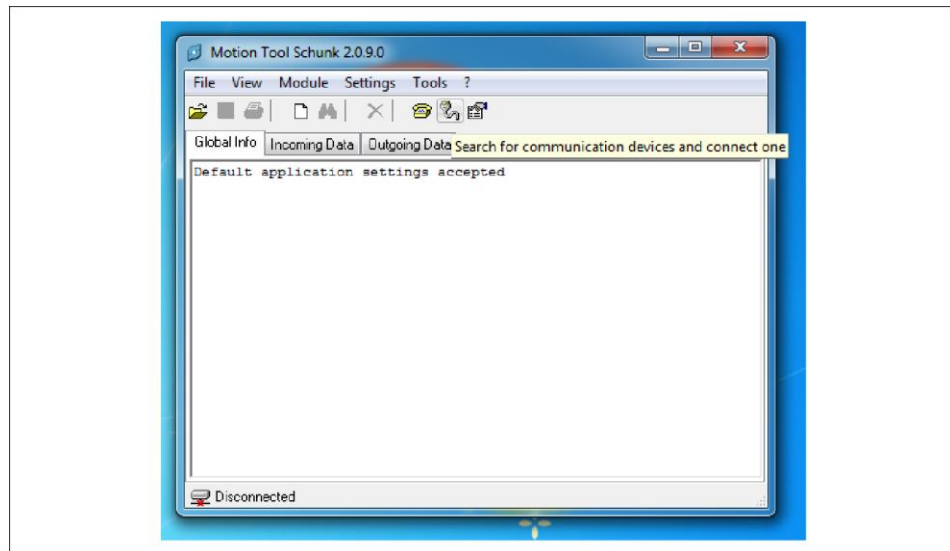
⇒ The new module is detected and the USB driver for this module is installed automatically.

3.3 Open Motion Tool Schunk (MTS)

- ✓ PC is connected to the module.

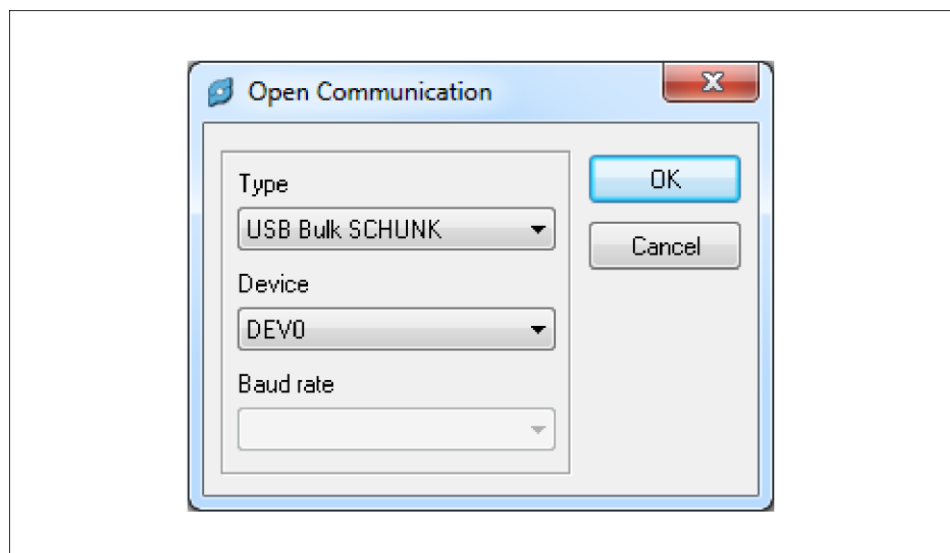


1 Open software via "mts.exe".



⇒ The program window is displayed.

2 First select "Settings" and then "Open Communication".



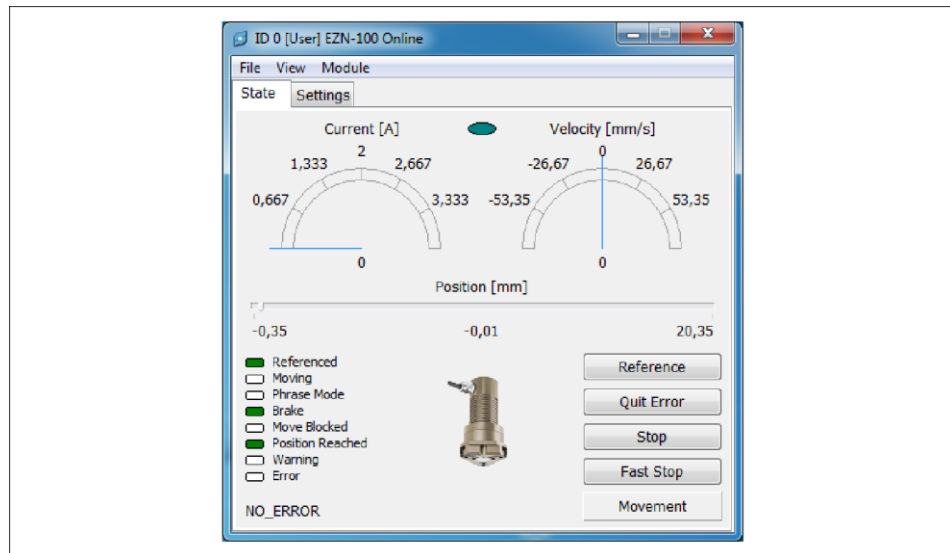
⇒ The "Open Communication" window is opened

3 Select the "USB Bulk SCHUNK" interface and click on "OK".

⇒ The communication is established.

NOTE

Searching for available modules may take a few minutes.

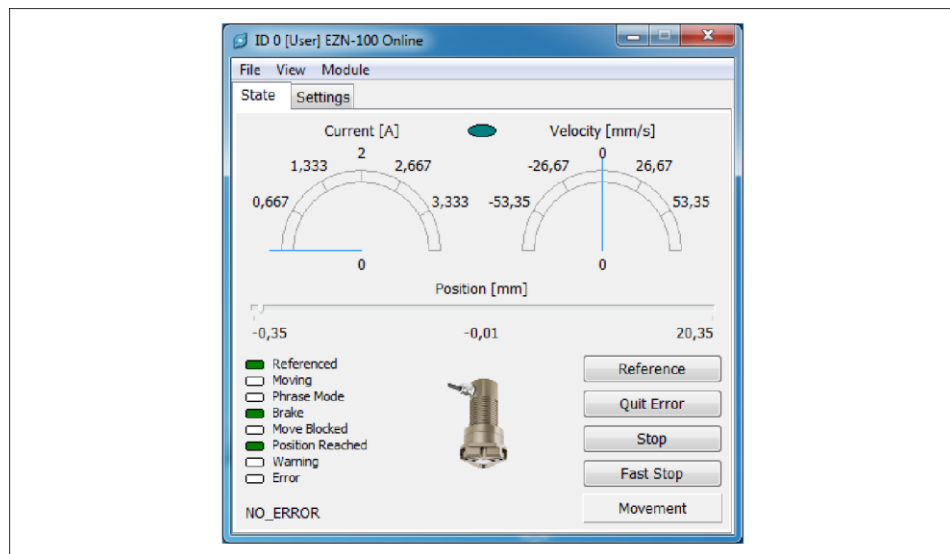


⇒ Module window is displayed.

NOTE

In the module window the module's status is shown, parameters can be changed and SMP commands can be tested.

3.4 Initial operation of the module



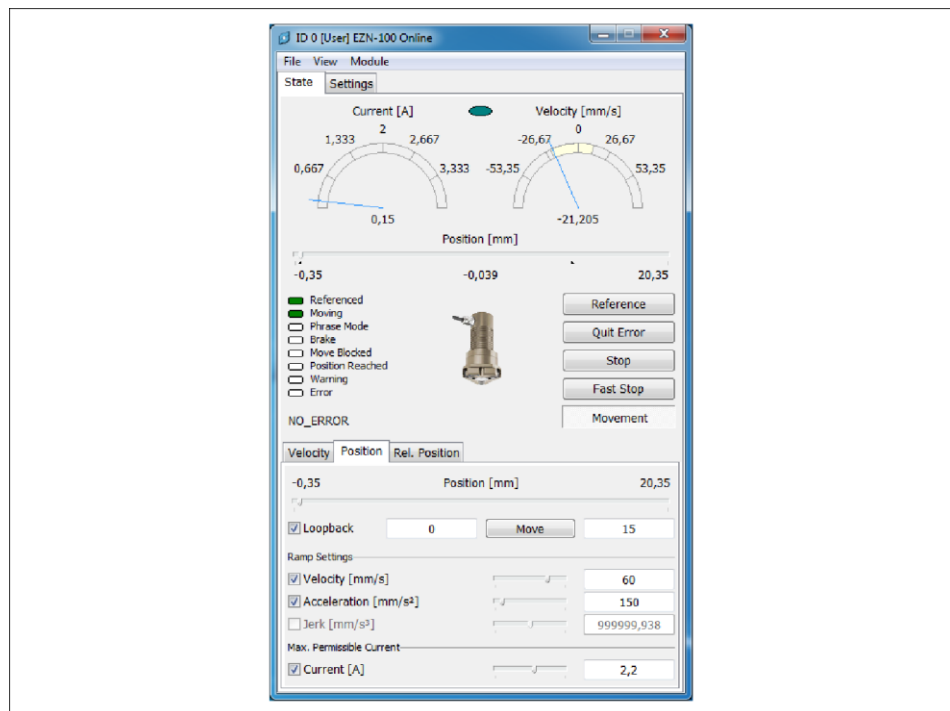
Module window

An initial commissioning of the module can be performed without further parameterizing.

The status of the module is displayed on the left side of the module window.

The most important SMP commands can be selected on the right side of the module window. All the other possible SMP commands can be found under the "Module" window.

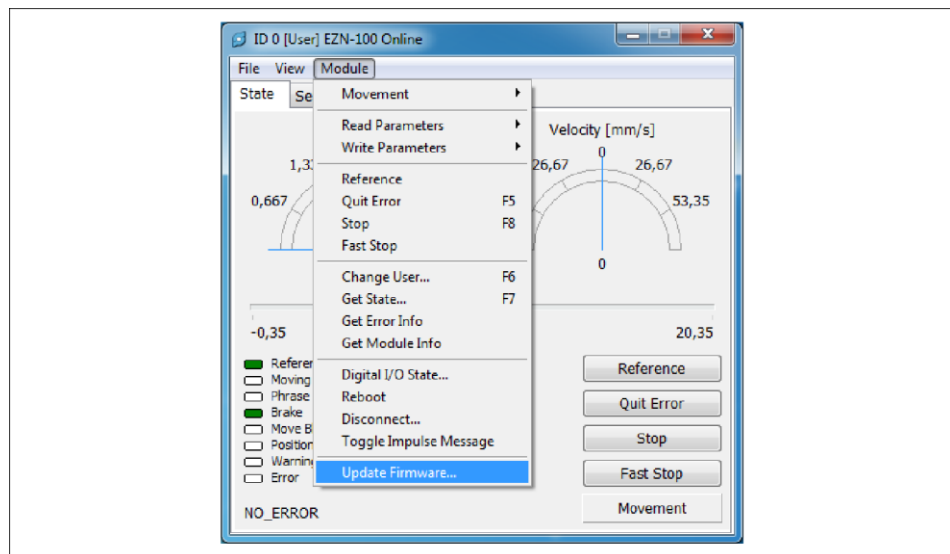
- 1 Click on "Movement".



⇒ Additional control elements for movement commands are displayed.

2 Click on "Move".

⇒ The module is moving in the adjusted cycle.



3 In order to test further SMP commands, select the "Module" menu.

3.5 Fast stop



The "Fast Stop" window occurs as soon as a module is connected to the software and detected by it.

If the "Fast Stop" button is pushed, the software sends a CMD FAST STOP to all detected modules. This causes that all movements are stopped immediately.

The "Fast Stop" window is always located in the foreground.

If the communication between software and module ends, the "Fast Stop" window is closed.

4 Troubleshooting

4.1 Vector CAN driver

Possible cause	Corrective action
The file "vcand32.dll" cannot be found.	Copy the DLL file from the Vector CAN installation directory to the software installation directory
	Paste the directory containing the DLL file into the windows PATH variable.
	Copy the DLL file to the Windows system directory "system32".

4.2 Peak CAN driver

Possible cause	Corrective action
The file "PCANBasic.dll" (32 bit version) cannot be found.	Copy the DLL file from the CD supplied with the device to the software installation directory.
	Paste the directory containing the DLL file into the windows PATH variable.
	Copy the DLL file to the Windows system directory "system32" (32 bit version) or "SysWow64" (64 bit version).

4.3 Softing CAN driver

Possible cause	Corrective action
The file "canL2.dll" cannot be found.	Copy the DLL file from the CD supplied with the device to the software installation directory.
	Paste the directory containing the DLL file into the windows PATH variable.
	Copy the DLL file to the Windows system directory "system32".

4.4 ESD CAN interface

Possible cause	Corrective action
When the interface is searched for active modules without having switched on at least one module in the process, the card switches into the bus off status.	Activate at least one module for the CAN communication.
	If no module is responding, search the bus system manually for active modules.

4.5 Siemens Profibus interface

Possible cause	Corrective action
The application does not detect any module in the bus system.	Check if the module is charged.
	Restart module.

4.6 Timeouts in serial communication

Possible cause	Corrective action
The module is not responding (Timeout).	Increase the time interval for the GET STATE command or switch off the status information if it is not being used.
	Increase the baudrate for the serial interface.
	Increase the value for the communication timeout under "settings" in the program window.
	Actuate less modules at the same time.

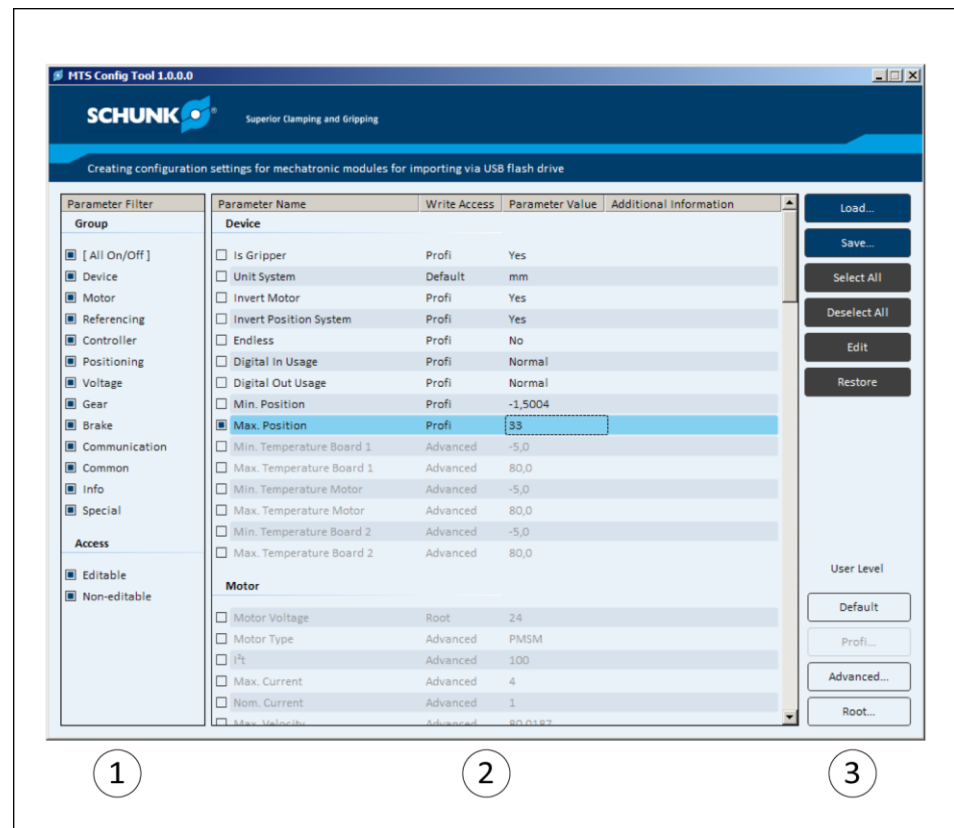
5 Software "MTS Config Tool"

The current configuration of the module can be managed via the "MTS Config Tool" software.

Importing and exporting parameters is done via USB flash drive. For this purpose a direct connection between Controller ECM and computer is not necessary.

The "MTS Config Tool" software is not part of the Motion Tool Schunk (MTS) and can be opened via DVD or on the computer. In order to open "MTS Config Tool" on the computer, copy the "MTS Config Tool.exe" file to a random directory on the computer.

NOTICE! Installing the "MTS Config Tool" is not necessary



1 **Parameter Filter**

Parameter groups can be activated or deactivated. Activated parameters are displayed in the parameter list.

2 **Parameter List**

The parameters of the activated parameter group are displayed. The parameters in grey are not editbale due to the limited user right.

- **Parameter Name**
 - Designation of the parameter.
- **Write Access**
 - User level required for editing.
- **Parameter Value**
 - Optionally editable value of the parameter.
- **Additional information**
 - Additional comments or warnings regarding the parameter which occurred while loading.

3 **Function Buttons**

Different functions can be selected.

- **Load**
 - A parameter list is loaded from a configuration or log file.
- **Save**
 - A parameter list is saved in a configuration file.
- **Select All**
 - All parameters are marked in a list for saving.
- **Deselect All**
 - All markings are removed.
- **Edit**
 - Parameter value can be edited. All parameters with changed values are highlighted in color.
- **Restore**
 - The parameter's value is restored.

- User Level
 - After selecting the user level, parameters that are not editable on this level are depicted in grey. There are four user levels:
 - Default: Access with only minimal write access.
 - Profi: Entering password is necessary.
 - Advanced: Entering password is necessary.
 - Root: Entering password is necessary.

Name of the parameter file

The file extension of the parameter file which is saved from the controller to the USB flash drive is *.sav. The file extension of the parameter file which is saved from the computer to the USB flash drive is *.par.

If there is already a parameter file (IDXX_YYY.sav) on the USB flash drive, the file is not overwritten. The new parameter file is counted up by one version and saved e.g. IDOC_001.sav if the version IDOC_000.sav has already been saved.

In order to change the configuration of the module, you can give the parameter file a general or a module-specific name.

- IDXX_Set.par
 - The parameter file can be used for all modules.
- ID00_Set.par
 - The parameter file can only be used for the module with the ID entered in the file name. In this case ID=0.

Changing the configuration of the module via USB flash drive

NOTE

The USB flash drive must be formatted in the data systems FAT 16 or FAT 32.

- 1 Turn on logic voltage supply at the controller.
- 2 Plug USB flash drive in USB host (USB2) interface at the controller.
- 3 Turn switch 3 at DIP switch SW1 in ON position (HOST enable).
 - ⇒ The seven-segment display shortly indicates "GET" and then "HOS".
 - ⇒ The current configuration of the module is saved on the USB flash drive.
- 4 Plug USB flash drive in the computer and start "MTS Config Tool".
- 5 Load configuration file via "Load" button into the "MTS Config Tool".
- 6 Change parameter values.
- 7 Mark all changed parameters.
- 8 Save configuration file on USB flash drive via "Save" button.
- 9 Turn on logic voltage supply at the computer.
- 10 Plug USB flash drive in "USB-Host" (USB2) interface at the controller.
- 11 Turn switch 3 at DIP switch SW2 into ON position (HOST enable).
 - ⇒ The seven-segment display shortly indicates SET and then TOG.
 - ⇒ The changed configuration of the module is transferred.
- 12 Remove USB flash drive.
- 13 Turn switch 3 at DIP switch SW1 into OFF position.
- 14 Turn switch 4 at DIP switch SW2 into OFF position.
- 15 Restart controller. To do so, switch off logic voltage, wait ca. 20 seconds and switch it on again.