



# Operating Instructions



## **MOVI-C® CONTROLLER** advanced UHX45A



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## 1 General information

### 1.1 About this documentation

#### **The documentation at hand is the original.**

This documentation is an integral part of the product. The documentation is intended for all employees who perform work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the systems and their operation as well as persons who work on the product independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation or if you require further information, contact SEW-EURODRIVE.

### 1.2 Validity of the documentation

The operating instructions at hand are valid only for products with a type designation according to the type code described in chapter "Device structure".

### 1.3 Other applicable documentation

Refer to the corresponding documentation for all other components.

Always use the latest edition of the documentation and the software.

The SEW-EURODRIVE website ([www.sew-eurodrive.com](http://www.sew-eurodrive.com)) provides a wide selection of documents for download in various languages. If required, you can also order printed and bound copies of the documentation from SEW-EURODRIVE.

### 1.4 Structure of the safety notes

#### 1.4.1 Meaning of signal words

The following table shows the grading and meaning of the signal words for safety notes:

Signal word	Meaning	Consequences if disregarded
<b>⚠ DANGER</b>	Imminent hazard	Severe or fatal injuries
<b>⚠ WARNING</b>	Possible dangerous situation	Severe or fatal injuries
<b>⚠ CAUTION</b>	Possible dangerous situation	Minor injuries
<b>NOTICE</b>	Possible damage to property	Damage to the product or its environment
<b>INFORMATION</b>	Useful information or tip: Simplifies handling of the product.	

#### 1.4.2 Structure of section-related safety notes

Section-related safety notes do not apply to a specific action but to several actions pertaining to one subject. The hazard symbols used either indicate a general hazard or a specific hazard.



This is the formal structure of a safety note for a specific section:

#### SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

### Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Meaning
	General hazard

#### 1.4.3 Structure of embedded safety notes

Embedded safety notes are directly integrated into the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

**⚠ SIGNAL WORD!** Type and source of hazard. Possible consequence(s) if disregarded. Measure(s) to prevent the hazard.

### 1.5 Decimal separator in numerical values

In this document, a period is used to indicate the decimal separator.

Example: 30.5 kg

### 1.6 Rights to claim under limited warranty

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the product.

### 1.7 Product names and trademarks

The brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

#### 1.7.1 Trademark of Beckhoff Automation GmbH

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

**EtherCAT®** 

## 1.8 Copyright notice

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## 1.9 Short designation

The following short designation is used in this documentation.

Type designation	Short designation
MOVI-C® CONTROLLER advanced UHX45A	MOVI-C® CONTROLLER
MOVI-C® CONTROLLER advanced UHX45A without L-carrier MDM90A	Compact controller
MOVI-C® CONTROLLER advanced UHX45A with L-carrier MDM90A	Master module

## **2 Safety notes**

### **2.1 Preliminary information**

The following general safety notes serve the purpose of preventing injury to persons and damage to property. They primarily apply to the use of products described in this documentation. If you use additional components, also observe the relevant warning and safety notes.

### **2.2 Duties of the user**

As the user, you must ensure that the basic safety notes are observed and complied with. Make sure that persons responsible for the machinery and its operation as well as persons who work on the device independently have read through the documentation carefully and understood it.

As the user, you must ensure that all of the work listed in the following is carried out only by qualified specialists:

- Setup and installation
- Installation and connection
- Startup
- Maintenance and repairs
- Shutdown
- Disassembly

Ensure that the persons who work on the product pay attention to the following regulations, conditions, documentation, and information:

- National and regional safety and accident prevention regulations
- Warning and safety signs on the product
- All other relevant project planning documents, installation and startup instructions, and wiring diagrams
- Do not assemble, install or operate damaged products
- All system-specific specifications and conditions

Ensure that systems in which the product is installed are equipped with additional monitoring and protection devices. Observe the applicable safety regulations and legislation governing technical work equipment and accident prevention regulations.

### 2.3 Target group

Specialist for mechanical work	<p>Any mechanical work may be performed only by adequately qualified specialists. Specialists in the context of this documentation are persons who are familiar with the design, mechanical installation, troubleshooting, and maintenance of the product who possess the following qualifications:</p> <ul style="list-style-type: none"> <li>• Qualifications in the field of mechanics in accordance with the national regulations</li> <li>• Familiarity with this documentation</li> </ul>
Specialist for electrotechnical work	<p>Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product who possess the following qualifications:</p> <ul style="list-style-type: none"> <li>• Qualifications in the field of electrical engineering in accordance with the national regulations</li> <li>• Familiarity with this documentation</li> </ul>
Additional qualifications	<p>In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation.</p> <p>The persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.</p>
Instructed persons	<p>All work in the areas of transport, storage, installation, operation and waste disposal may only be carried out by persons who are trained and instructed appropriately. These instructions must enable the persons to carry out the required activities and work steps safely and in accordance with regulations.</p>

### 2.4 Designated use

The product is intended for control cabinet installation in electrical systems or machines.

In case of installation in electrical systems or machines, startup of the product is prohibited until it is determined that the machine meets the requirements stipulated in the local laws and directives. For Europe, Machinery Directive 2006/42/EC as well as the EMC Directive 2014/30/EU apply. Observe EN 60204-1 (Safety of machinery — electrical equipment of machines).

Technical data and information on the connection conditions are provided on the nameplate and in chapter "Technical data" in the documentation. Always comply with the data and conditions.

Unintended or improper use of the product may result in severe injury to persons and damage to property.

#### 2.4.1 Restrictions under the European WEEE Directive 2012/19/EU

Options and accessories from SEW-EURODRIVE may only be used in combination with products from SEW-EURODRIVE.



### 2.4.2 Lifting applications

To avoid danger of fatal injury due to falling hoists, observe the following points when using the product in lifting applications:

- Use mechanical protection devices.
- Perform a hoist startup.

### Application in ELSM® control mode

When the inverter is operated in ELSM® control mode, using it in lifting applications is not permitted. In this control mode only applications of horizontal materials handling are permitted.

## 2.5 Functional safety technology

The product must not perform any safety functions without a higher-level safety system unless explicitly allowed by the documentation.

## 2.6 Transport

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product is damaged, it must not be assembled, installed or started up.

Observe the following notes when transporting the device:

- Ensure that the product is not subject to mechanical impact.

If necessary, use suitable, sufficiently dimensioned handling equipment.

Observe the information on climatic conditions in chapter "Technical data" (→ 66) of the documentation.

## 2.7 Installation/assembly

Ensure that the product is installed and cooled in accordance with the regulations in the documentation.

Protect the product from excessive mechanical strain. The product and its mounted components must not protrude into the path of persons or vehicles. Ensure that no components are deformed or no insulation spaces are modified, particularly during transportation. Electrical components must not be mechanically damaged or destroyed.

Observe the notes in chapter "Mechanical installation" (→ 30) in the documentation.

### 2.7.1 Restrictions of use

The following applications are prohibited unless the device is explicitly designed for such use:

- Use in potentially explosive atmospheres
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, and radiation
- Operation in applications with impermissibly high mechanical vibration and shock loads in excess of the regulations stipulated in EN 61800-5-1
- Use at an elevation of more than 3800 m above sea level

## 2.8 Electrical installation

Ensure that all of the required covers are correctly attached after the electrical installation.

Make sure that preventive measures and protection devices comply with the applicable regulations (e.g. EN 60204-1 or EN 61800-5-1).

### 2.8.1 Required preventive measure

Make sure that the product is correctly attached to the ground connection.

### 2.8.2 Stationary application

Necessary preventive measure for the product:

Type of energy transfer	Preventive measure
Direct power supply	<ul style="list-style-type: none"> <li>• Ground connection</li> </ul>

## 2.9 Protective separation

The product meets all requirements for protective separation of power and electronics connections in accordance with EN 61800-5-1. The connected signal circuits must meet requirements according to SELV (**S**afety **E**xtra **L**ow **V**oltage) or PELV (**P**rotective **E**xtra **L**ow **V**oltage) to ensure protective separation. The installation must meet the requirements for protective separation.

In order to avoid exceeding the permitted contact voltages in SELV or PELV power circuits in the event of a fault, continuous equipotential bonding is required in the vicinity of these power circuits. If this is not possible, other preventive measures must be taken. These preventive measures are described in EN 61800-5-1.

## 2.10 Startup/operation

Observe the safety notes in chapters "Startup" (→ 47) and "Operation" (→ 53) in this documentation.

Make sure the connection boxes are closed and screwed before connecting the supply voltage.

Depending on the degree of protection, products may have live, uninsulated, and sometimes moving or rotating parts as well as hot surfaces during operation.

When the device is switched on, dangerous voltages are present at all power connections as well as at any connected cables and terminals. This also applies even when the product is inhibited and the motor is at standstill.

Risk of burns due to arcing: Do not disconnect power connections during operation. Do not connect power connections during operation.

If you disconnect the product from the voltage supply, do not touch any live components or power connections because capacitors might still be charged. Observe the following minimum switch-off time:

10 minutes.

Observe the corresponding information signs on the product.

The fact that the operation LED and other display elements are no longer illuminated does not indicate that the product has been disconnected from the supply system and no longer carries any voltage.

Mechanical blocking or internal protective functions of the product can cause a motor standstill. Eliminating the cause of the problem or performing a reset may result in the drive restarting automatically. If, for safety reasons, this is not permitted for the drive-controlled machine, first disconnect the product from the supply system and then start troubleshooting.

Risk of burns: The surface temperature of the product can exceed 60 °C during operation. Do not touch the product during operation. Let the product cool down before touching it.

## 2.10.1 Energy storage unit

Products with a connected energy storage unit are not necessarily de-energized when they have been disconnected from the supply system. Usually, the energy storage unit stores sufficient energy to continue operation of the connected motors for a limited period of time. It is not sufficient to observe a minimum switch-off time.

Perform a shutdown as described in the documentation in the chapter "Service" > "Shutdown".

## 2.11 IT security

### 2.11.1 Contact



If you require configuration support, contact SEW-EURODRIVE Service or visit the [Product Security Management website](#). There you will find various contact options for reporting safety-related problems.

### 2.11.2 IT security of the product




The product has no access levels.

The IT security of the product is only guaranteed when used in an environment secured by defense-in-depth strategies.

### 2.11.3 IT security of the environment



For drive and control components that are integrated in a network (e.g. fieldbus or Ethernet network), settings can even be made from more remote locations. There is a risk that a change of parameters that cannot be detected externally may result in unexpected, but not uncontrolled, system behavior and may have a negative impact on operational safety, system availability, or data security.

Ensure that unauthorized access is prevented, particularly with respect to Ethernet-based networked systems and engineering interfaces. Using IT-specific security standards, such as network segmentation, adds to the protection of access to the ports. For an overview of the ports and of the services provided by the communication interfaces, refer to chapter "Technical data" (→  66). The IT security of the product is only guaranteed when used in an environment secured by defense-in-depth strategies.

Ensure that clear responsibility for security is ensured during operation. SEW-EURODRIVE recommends an IT security management system in accordance with ISO/IEC 27001 and ISO/IEC 62443-2-4.

## 3 Device structure

### 3.1 Device description

The MOVI-C® CONTROLLER in the performance class "advanced" is a motion controller for demanding automation tasks. The real-time operating system guarantees very short response times as well as a high-performance connection of system buses from SEW-EURODRIVE and standard fieldbuses.

The MOVI-C® CONTROLLER is suitable for automating machines and cells for up to 8 interpolating axes and 8 auxiliary axes depending on the size of the application program. It can be used as a module controller for complex motion functions, such as electronic cams and robotics.

### 3.2 Device variants

MOVI-C® CONTROLLER is available in the following device variants:

#### INFORMATION

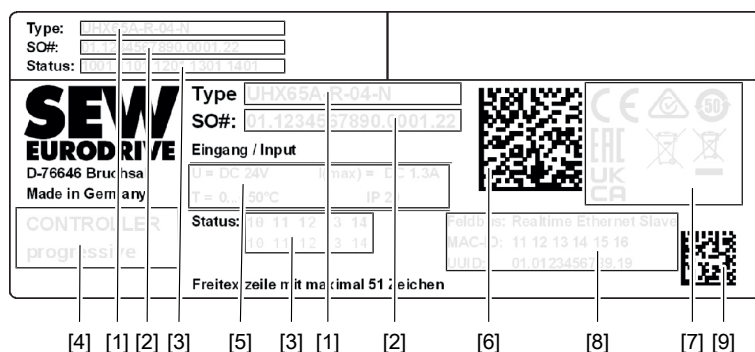


When using the fieldbus variants, observe the respective communication manual available from the Online Support of SEW-EURODRIVE.

Device variant	Fieldbus interface
UHX45A-N	MOVI-C® CONTROLLER with PROFINET IO fieldbus interface for slave connection as compact controller
UHX45A-N /MDM90A	MOVI-C® CONTROLLER with PROFINET IO fieldbus interface for slave connection as master module
UHX45A-E	MOVI-C® CONTROLLER with EtherNet/IP™ or Modbus TCP fieldbus interface for slave connection as compact controller
UHX45A-E /MDM90A	MOVI-C® CONTROLLER with EtherNet/IP™ or Modbus TCP fieldbus interface for slave connection as master module

### 3.3 Nameplate

The following figure shows an example of the nameplate of the device:



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- |                        |   |
|------------------------|---|
| [1] "Type code" (→ 17) | [6] Data matrix code with type designation, serial number and device status |
| [2] Serial number      | [7] "Markings" (→ 66)   |
| [3] Device status      | [8] Data of the fieldbus interface  |
| [4] Device name        | [9] Data matrix code with MAC ID of the fieldbus interface                  |
| [5] Input data         |   |

### 3.4 Product label

The product label with QR code is clearly visible attached on the front of the device.

By scanning the QR code you will be forwarded to the digital services of SEW-EURODRIVE. There, you have access to product-specific data, documents, and further services.

For more information, refer to the chapter "Markings" (→ 66).



### 3.5 Type code

The following tables show the structure of the type code:

#### 3.5.1 Compact controller

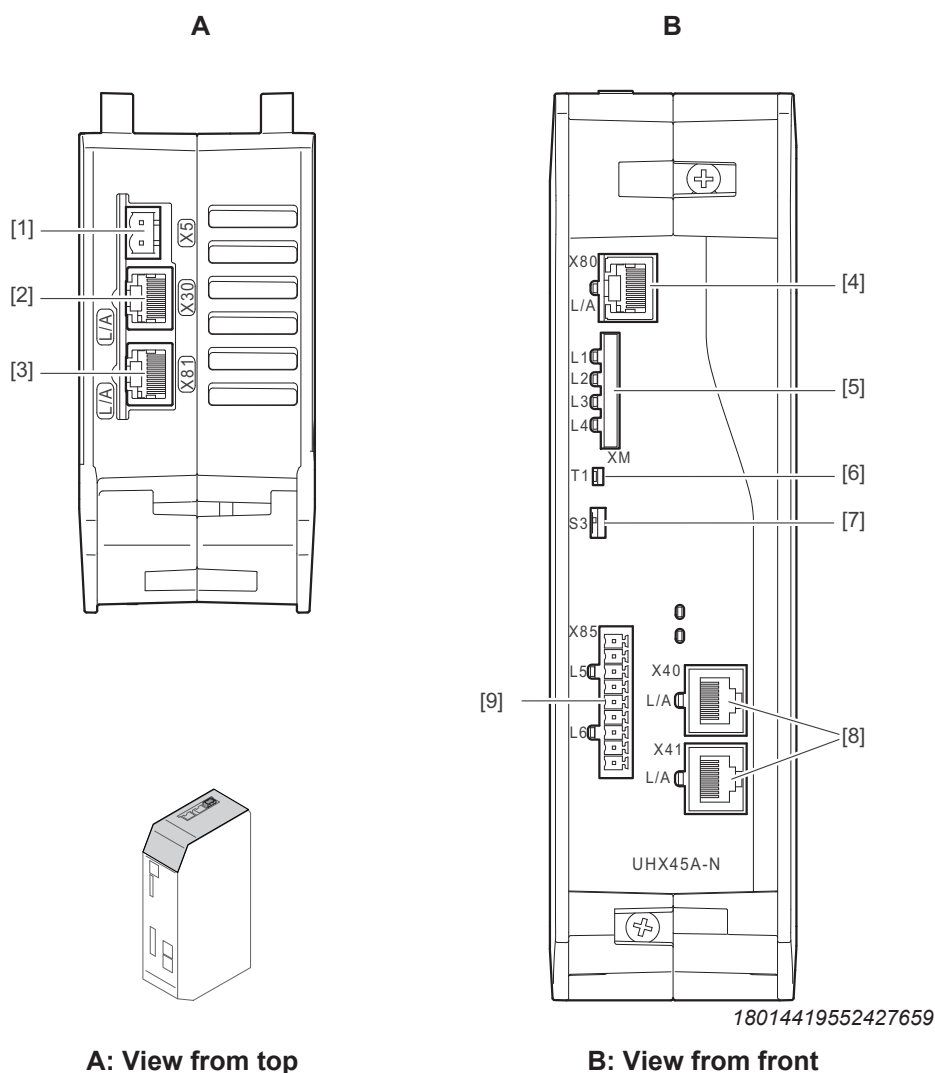
For example: UHX45A-N		
Product name	<b>UHX</b>	MOVI-C® CONTROLLER
Series	<b>45</b>	Advanced
Version	<b>A</b>	Version status
Design	<b>N</b>	<ul style="list-style-type: none"> <li>N = with PROFINET IO fieldbus interface</li> <li>E = with EtherNet/IP™ or Modbus TCP fieldbus interface</li> </ul>

#### 3.5.2 Master module

For example: UHX45A-N /MDM90A		
Product name	<b>UHX</b>	MOVI-C® CONTROLLER
Series	<b>45</b>	Advanced
Version	<b>A</b>	Version status
Design	<b>N</b>	<ul style="list-style-type: none"> <li>N = with PROFINET IO fieldbus interface</li> <li>E = with EtherNet/IP™ or Modbus TCP fieldbus interface</li> </ul>
Product name	<b>MD</b>	MOVIDRIVE®
Device type	<b>M</b>	Master module
Series	<b>90</b>	Standard variant
Version	<b>A</b>	Version status

### 3.6 Terminals

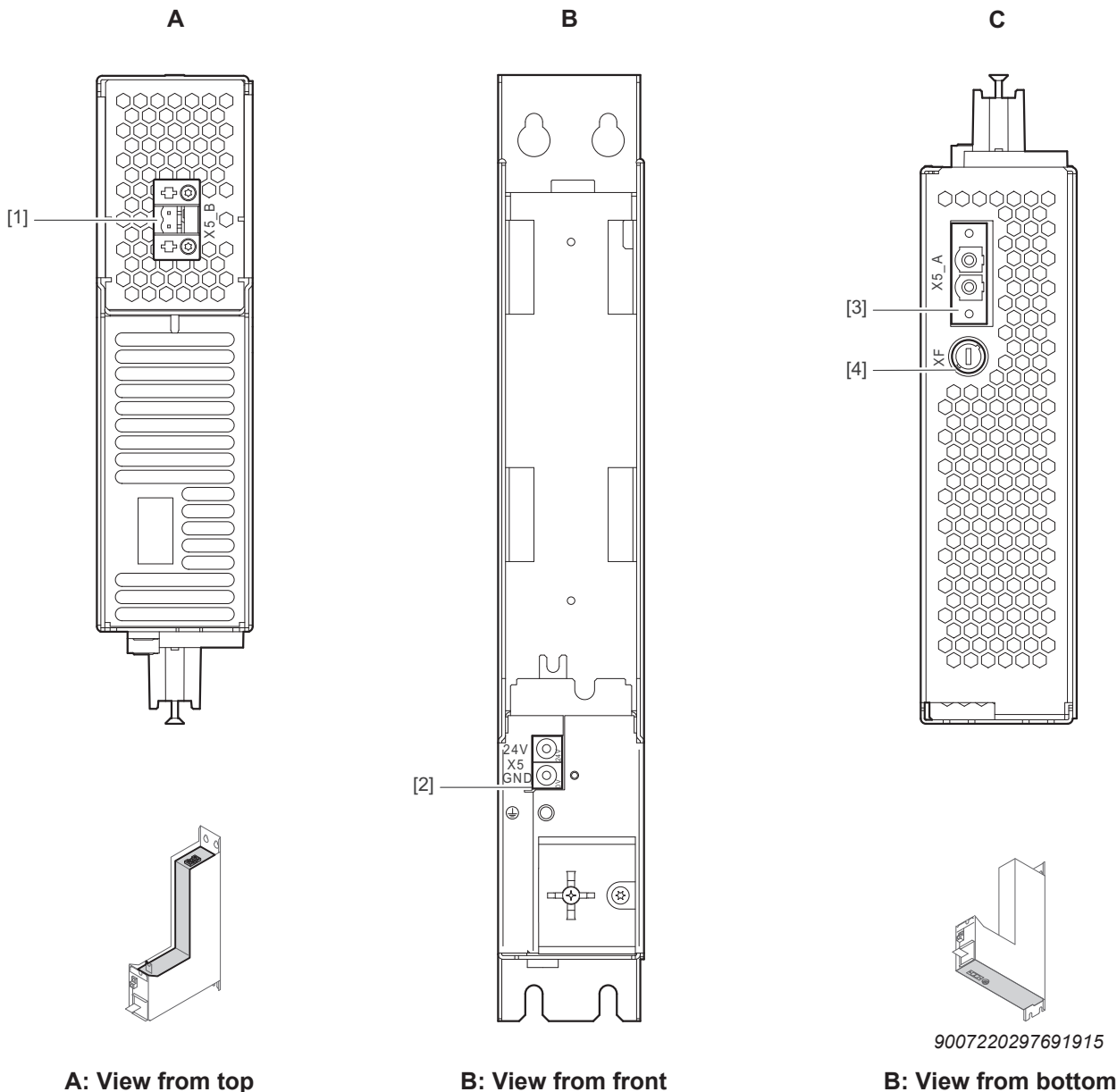
#### 3.6.1 MOVI-C® CONTROLLER



No.	Designation	Terminal	Function
[1]	DC 24 V supply voltage connection (2-pin connection)	X5	DC 24 V voltage supply
[2]	EtherCAT®/SBus <sup>PLUS</sup> interface (RJ45 socket)	X30	EtherCAT®/SBus <sup>PLUS</sup> master connection
[3]	Engineering interface (RJ45 socket)	X81	Engineering PC connection IP address on the SD memory card set by the user (default IP address of the X81 engineering interface on delivery: 10.1.254,128)
[4]	Engineering interface (RJ45 socket)	X80	Engineering PC connection Default IP address: 192.168.10.4 (dependent on the setting of DIP switch S3)

No.	Designation	Terminal	Function
[5]	SD card slot	XM	Card slot for SD memory card OMH45A (control section with firmware, IEC program, user data) <b>INFORMATION:</b> Make sure the SD memory card is correctly aligned when inserting it: The nameplate must be on the right side of the SD memory card.
[6]	Reset button	T1	Reset
[7]	DIP switch	S3	<ul style="list-style-type: none"> <li>Bottom position: Standard IP address of the X80 engineering interface: 192.168.10.4 (cannot be changed)</li> <li>Top position: IP address on the SD memory card set by the user (default IP address of the X80 engineering interface on delivery: 192.168.10.4)</li> </ul>
[8]	Fieldbus interface (RJ45 socket)	X40/X41	<ul style="list-style-type: none"> <li>MOVI-C® CONTROLLER UHX45A-N: Slave connection PROFINET IO</li> <li>MOVI-C® CONTROLLER UHX45A-E: Slave connection EtherNet/IP™ or Modbus TCP</li> </ul>
[9]	System bus and RS485 interface (9-pin connection)	X85	<ul style="list-style-type: none"> <li>RS485 interface</li> <li>CAN 1 system bus</li> <li>CAN 2 system bus</li> </ul>

### 3.6.2 L-carrier MDM90A



No.	Designation	Terminal	Function
[1]	DC 24 V supply voltage output (2-pin connection)	X5_B	Voltage supply of the MOVI-C® CONTROLLER
[2]	Connection DC 24 V supply voltage	X5	Voltage supply of the MOVIDRIVE® axis system
[3]	External DC 24 V supply voltage	X5_A	Voltage supply input of the MOVIDRIVE® axis system and MOVI-C® CONTROLLER
[4]	Fusing for DC 24 V supply voltage: 5 × 20 mm glass tube, 4 A, 125 V, slow-blow	XF	Fusing for voltage supply MOVI-C® CONTROLLER

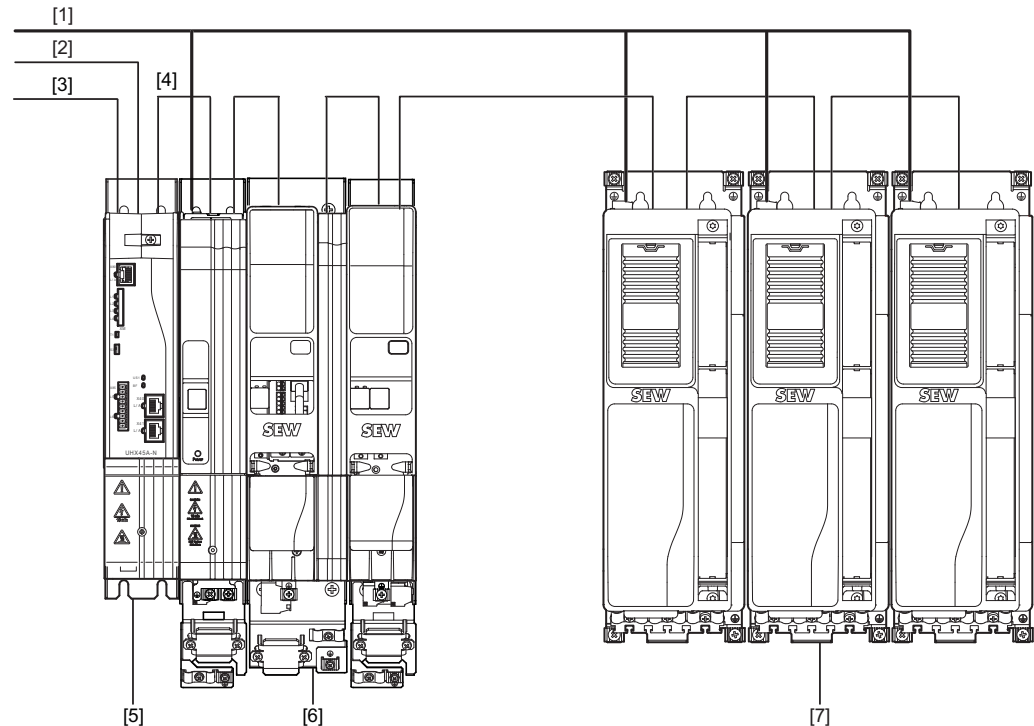
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### 3.7 Communication interfaces

MOVI-C® CONTROLLER has the following communication interfaces:

- The Ethernet communication interfaces are used for engineering the MOVI-C® CONTROLLER, for connecting a keypad, and for communication with other Ethernet stations (e.g. with a higher-level controller).
- The EtherCAT®/SBus<sup>PLUS</sup> interface is used to control drive inverters, I/O modules and other EtherCAT® slave components.

The following figure illustrates the use of the communication interfaces:



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- |   |  |
|---|--|
| [1] Line voltage                              | [5] MOVI-C® CONTROLLER (master module) |
| [2] Fieldbus connection                       | [6] MOVIDRIVE® modular axis system     |
| [3] Engineering connection                    | [7] MOVIDRIVE® system                  |
| [4] EtherCAT®/SBus <sup>PLUS</sup> connection |  |

### 3.7.1 Engineering interface

The following functions are implemented via the engineering interface (X80):

- Engineering of the MOVI-C® CONTROLLER
- PC visualization (e.g. OPC interface)
- Connection to the master level

The engineering of the MOVI-C® CONTROLLER comprises the following activities:

- Configuration
- Parameterization
- Programming

Engineering is carried out using the MOVISUITE® engineering software. The software has a number of useful features for startup and diagnostics of all connected SEW-EURODRIVE devices.

### 3.7.2 EtherCAT®/SBus<sup>PLUS</sup> interface

The following devices can be connected to the MOVI-C® CONTROLLER via the EtherCAT®/SBus<sup>PLUS</sup> interface (X30):

- MOVIDRIVE® modular application inverter
- MOVIDRIVE® system application inverter
- MOVI-PLC® I/O system C
- Third-party components with ESI project planning file

The maximum number of slave components that can be connected to the MOVI-C® CONTROLLER is 64.

### 3.7.3 CAN system bus

The communication interface is available for project-specific use. Before using the communication interface, contact SEW-EURODRIVE Service.

MOVILINK®, CANopen and the control of generation B inverters cannot be implemented via the communication interface.

### 3.7.4 RS485 interface

The communication interface is available for project-specific use. Before using the communication interface, contact SEW-EURODRIVE Service.

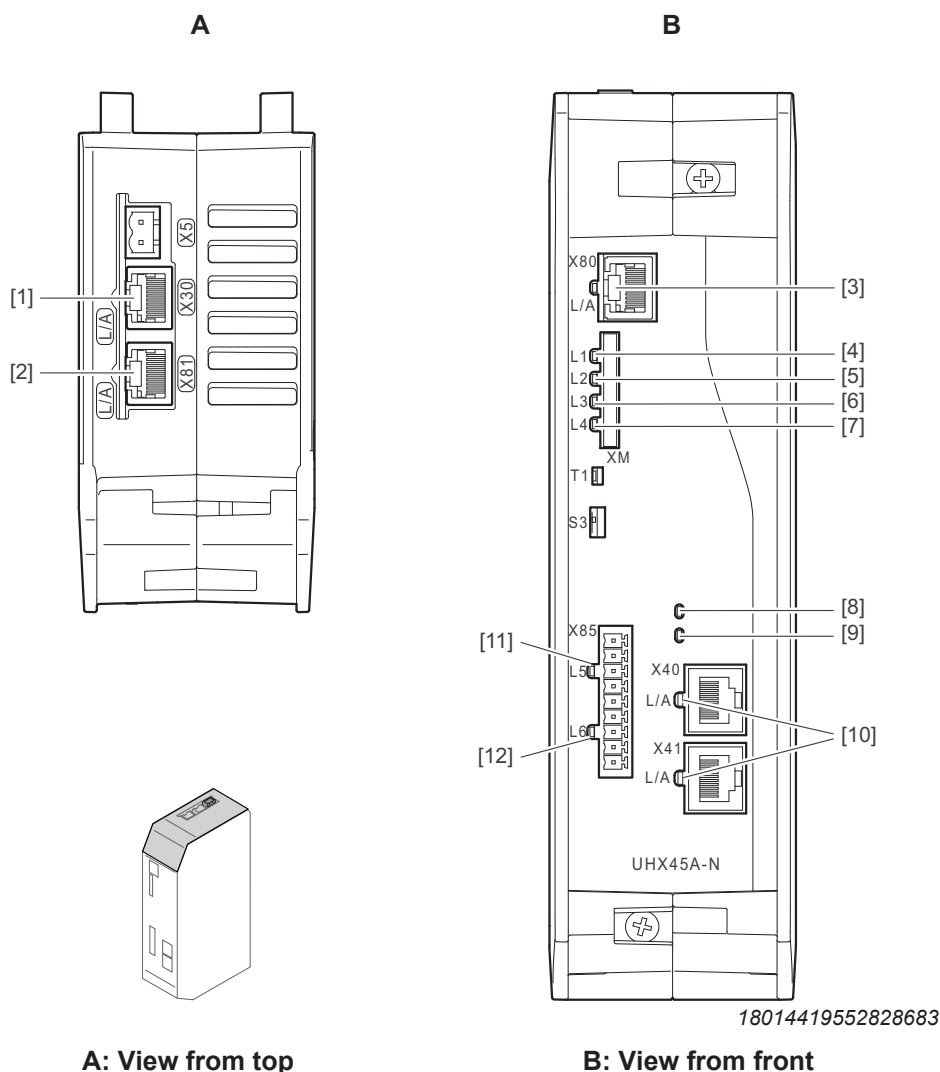
### 3.7.5 Fieldbus interface

The MOVI-C® CONTROLLER can be connected to a higher-level controller via the fieldbus interfaces (X40, X41).

The fieldbus interface is integrated into the MOVI-C® CONTROLLER.



### 3.8 Status LEDs



- [1] L/A: Status of the EtherCAT®/SBus<sup>PLUS</sup> connection
- [2] L/A: Status of the engineering connection (X81)
- [3] L/A: Status of the engineering connection (X80)
- [4] L1: Status of the MOVI-C® CONTROLLER firmware
- [5] L2: Status of the IEC program
- [6] L3: Reserved
- [7] L4: Reserved
- [8] PROFINET – US1: Operating state of the fieldbus
- EtherNet/IP™, Modbus TCP – MS (Module Status): Status of the bus electronics
- [9] PROFINET – BF (BUS FAULT): Bus fault
- EtherNet/IP™, Modbus TCP – NS (Network Status): Status of the fieldbus connection
- [10] L/A: Status of the fieldbus connection
- [11] L5: Status of the CAN 1 system bus
- [12] L6: Status of the CAN 2 system bus

## 3.8.1 Status LED "L1"

Indicates the status of the firmware during the boot phase as well as during operation.

## During boot phase

Status	Possible cause	Measure
Red	The firmware of the device fails to boot.	Contact SEW-EURODRIVE Service.
Orange	The SD memory card is not inserted.	Insert a SD memory card into the device.
	The data system of the SD memory card is corrupt.	Contact SEW-EURODRIVE Service.
Green	The SD memory card has faulty contents.	Contact SEW-EURODRIVE Service.
Red, flashing at 1 Hz	The SD memory card has faulty contents. The firmware of the device is faulty.	Contact SEW-EURODRIVE Service.

## During operation

Status	Possible cause	Measure
Green, flashing at 0.5 Hz	Firmware of the device is running properly.	–
Red, flashing at 0.5 Hz	The firmware of the device is faulty.	Contact SEW-EURODRIVE Service.

## 3.8.2 Status LED "L2"

Indicates the status of the IEC program.

Status	Meaning	Measure
Off	No IEC program loaded.	Load an IEC program on the device.
Orange, flashing at 0.5 Hz	Program has stopped running.	Start the IEC program.
Red, flashing at 0.5 Hz	The IEC program is faulty.	Check and correct the IEC program.
Green, flashing at 0.5 Hz	IEC program is running correctly.	–

### 3.8.3 Status LED "L5"

Indicates the status of the CAN 1 system bus.

Status	Meaning
Off	The CAN bus is not configured in the IEC project.
ORANGE flashing at 0.5 Hz	The CAN bus is initialized (status: Init).
ORANGE	The CAN bus cannot be initialized (status: Init error).
GREEN	The CAN bus is configured and ready to start. L2 manager stopped.
GREEN flashing at 0.5 Hz	CAN bus communication running.
RED flashing at 0.5 Hz	The CAN bus issues a warning (status: Warning)

### 3.8.4 Status LED "L6"

Indicates the status of the CAN 2 system bus.

Status	Meaning
Off	The CAN bus is not configured in the IEC project.
ORANGE flashing at 0.5 Hz	The CAN bus is initialized (status: Init).
ORANGE	The CAN bus cannot be initialized (status: Init error).
GREEN	The CAN bus is configured and ready to start. L2 manager stopped.
GREEN flashing at 0.5 Hz	CAN bus communication running.
RED flashing at 0.5 Hz	The CAN bus issues a warning (status: Warning)

### 3.8.5 Status LEDs "L/A" (Link/Activity)

Indicate the status of the Ethernet connection.

Status LED	Meaning
Green	There is an Ethernet connection.
EtherCAT®/SBus <sup>PLUS</sup> interface: Green, flashing	Data is currently being exchanged via Ethernet.
Engineering interface and fieldbus interface: Orange, flashing	Data is currently being exchanged via Ethernet.
Off	There is no Ethernet connection.

### 3.8.6 PROFINET

#### Status LED "US1"

Indicates the operating state of the fieldbus. The status LED "US1" meets and expands the requirements of AIDA (Automation Initiative of German Domestic Automobile manufacturers).

Status	Possible cause	Measure
Green	The fieldbus electronics is running properly.	—
Green, flashing Lights up: 0.5 s Disabled: 3 s	The fieldbus electronics is in energy-saving mode (standby mode).	—
Orange, flashing Lights up: 0.25 s Disabled: 0.25 s	The fieldbus electronics is just running up after a reset.	—
Red	Error in the hardware of the device.	Switch the device off and back on again.  If the error occurs again, contact SEW-EURODRIVE Service.

#### Status LED "BF" (BUS FAULT)

Indicates a bus fault. The status LED "BF" meets and expands the requirements of AIDA (Automation Initiative of German Domestic Automobile manufacturers).

Status	Possible cause	Measure
Off	There is a controlling connection to the fieldbus master (higher-level controller).	—
Orange	The fieldbus slave (device) does not support the configured functions in the fieldbus master.	Perform the configuration again.
Red	<ul style="list-style-type: none"> <li>No connection could be established to the fieldbus master.</li> <li>The connection to the fieldbus master has been interrupted.</li> </ul>	Check the PROFINET device name in the fieldbus master and fieldbus slave.

### 3.8.7 EtherNet/IP™, Modbus TCP

#### Status LED "MS" (Module Status)

Indicates the status of the bus electronics.

Status	Possible cause	Measure
Green	The bus electronics is in standard operating state.	—
Green, flashing Lights up: 0.5 s Disabled: 0.5 s	The device is waiting for the data of a DHCP server to initialize the TCP/IP stack.	—
Red, flashing Lights up: 0.5 s Disabled: 0.5 s	Conflict detected while assigning the IP address. Another node in the network uses the same IP address.	Assign a unique IP address to the device.
Red	The bus electronics is in fault state.	Switch the device off and back on again.  If the fault occurs repeatedly, contact SEW-EURODRIVE Service.

#### Status LED "NS" (Network Status)

Indicates the status of the fieldbus connection.

Status	Possible cause	Measure
Off	The device does not yet have any IP address parameters.	Assign a unique IP address to the device.
Green	There is a controlling connection to the fieldbus master (PLC).	—
Green, flashing Lights up: 0.5 s Disabled: 0.5 s	The IP address parameters are configured, but there is no controlling connection to the fieldbus master.	<ul style="list-style-type: none"> <li>Check if the fieldbus master is switched on.</li> <li>Perform the configuration of the fieldbus master again.</li> </ul>
Red	Conflict detected while assigning the IP address. Another node in the network uses the same IP address.	Assign a unique IP address to the device.
Red, flashing Lights up: 0.5 s Disabled: 0.5 s	The controlling connection is in timeout state.	Re-establish the communication to the fieldbus master.

### 3.9 Accessories


#### 3.9.1 SD memory card OMH45A

The OMH45A SD memory card (**S**ecure **D**igital Memory Card) is required for operating the MOVI-C<sup>®</sup> CONTROLLER and contains the firmware, the IEC program, user data (e.g. recipes), and the parameter sets of the lower-level MOVI-C<sup>®</sup> inverters from SEW-EURODRIVE. You can use the memory card for data backup and automatic parameterization in case of "Device replacement" (→ 58).

The OMH45A SD memory card is plugged into the card slot (XM) of the MOVI-C<sup>®</sup> CONTROLLER.

#### 3.9.2 System bus cable

Cable for connecting MOVI-C<sup>®</sup> CONTROLLER and other automation components (such as MOVIDRIVE<sup>®</sup> modular/system application inverters)

Designation	Length	Connector	Part number
			
4-pole system bus cable, system bus EtherCAT <sup>®</sup> /SBus <sup>PLUS</sup>	• 0.29 m	2 × RJ45	• 18179959
	• 0.44 m		• 18179967
	• 0.75 m		• 18167039
	• 1.5 m		• 18179975
	• 3 m		• 18167047
	• 5 m		• 18179983
	• 10 m		• 18179991

For more information, refer to chapter "System bus cable" (→ 44).



## 4 Installation

### 4.1 Installation accessories

The listed accessories are included in the scope of delivery. The accessories can be ordered with the following part numbers:

#### Compact controller (UHX45A)

Accessory	Part number
Carrier plate UHX45A	28234863
Screw for support plate	00126497
DC 24 V voltage supply connector	19148410
Accessory shield plate UHX45A	28244389

#### Master module (UHX45A /MDM90A)

Accessory	Part number
L-carrier MDM90A	28241169
Accessory L-carrier MDM90A <b>In detail:</b> PE busbar 2 × connection DC 24 V supply voltage Pan head screw M6x16 Pan head screw M4x12 E connector DC 24 V supply voltage System bus cable 0.26 m (required if the master module is located directly next to the power supply module. For cables with a different length, see chapter "System bus cable" (→ 28))	28244397
Touch guard L-carrier MDM90A	18183859
Screw for touch guard	19189451
Accessory shield plate UHX45A	28244389
Fusing for DC 24 V supply voltage: 5 × 20 mm glass tube, 4 A, 125 V, slow-blow	13292668

## 4.2 Mechanical installation

### 4.2.1 General information



#### ⚠ CAUTION

Installing a defective or damaged MOVI-C® CONTROLLER.

Injury to persons and damage to property.

- Before installation, check the device for external damage and replace a damaged device.

#### NOTICE

Mounting the MOVI-C® CONTROLLER on a poorly conductive mounting surface.

Damage to the MOVI-C® CONTROLLER.

- The mounting plate in the control cabinet must be conductive over a large area for the mounting surface of the MOVI-C® CONTROLLER (metallically pure, good conductivity). EMC-compliant installation of the device can only be accomplished with a mounting plate that is conductive over a large area.

#### NOTICE

Non-compliance with the stipulated tightening torques.

Damage to the MOVI-C® CONTROLLER.

- Always adhere to the stipulated tightening torques. Otherwise, excessive heat can develop which would damage the device.

### 4.2.2 Minimum clearance and mounting position

MOVI-C® CONTROLLER is installed in the control cabinet. Observe the following for installation:

- To ensure unobstructed cooling of the MOVI-C® CONTROLLER, leave a minimum clearance of 100 mm above and below the device's housing. Make sure air circulation in the clearance is not impaired by cables or other installation equipment.
- Ensure unobstructed cooling air supply and make sure that the MOVI-C® CONTROLLER is not exposed to the warm exhaust air from other devices.
- There is no need for clearance at the sides of the device. You may connect the MOVI-C® CONTROLLER and other devices (e.g. MOVIDRIVE® modular) in series.
- Install the devices only vertically. You must not install them horizontally, tilted or upside down.

#### 4.2.3 Control cabinet installation

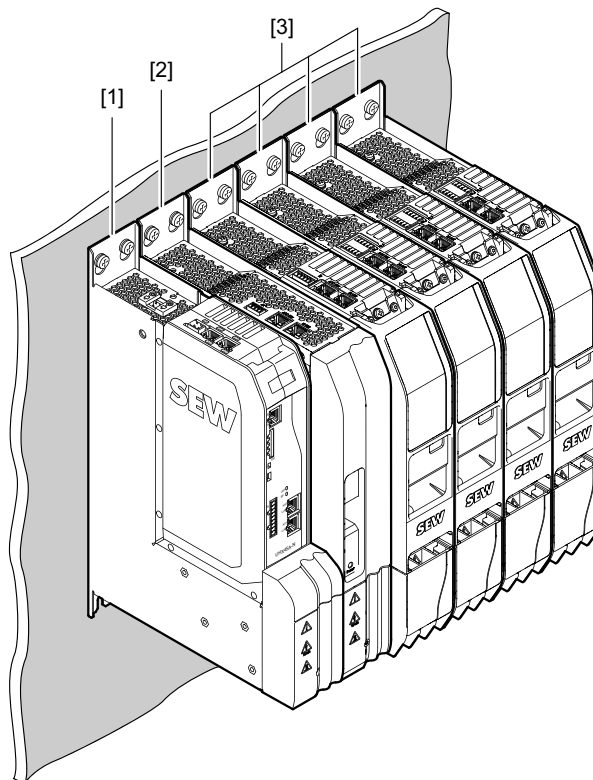
Control cabinet installation is shown at an axis system with a MOVI-C® CONTROLLER, a power supply module and several axis modules. The MOVI-C® CONTROLLER can either be used as compact controller or as master module.

##### Alignment in the axis system

When arranging the axis system, observe that the nominal output current  $I_N$  of the axis modules must decrease from left to right. The axis module with the highest nominal output current must be on the right side of the power supply module. All remaining axis modules are installed in descending order regarding their nominal output current.

When used as master module (see figure), as well as when used as compact controller, MOVI-C® CONTROLLER must always be installed left of the power supply module.

In one axis system, up to 15 axis modules can be used, both as single-axis modules and double-axis modules.

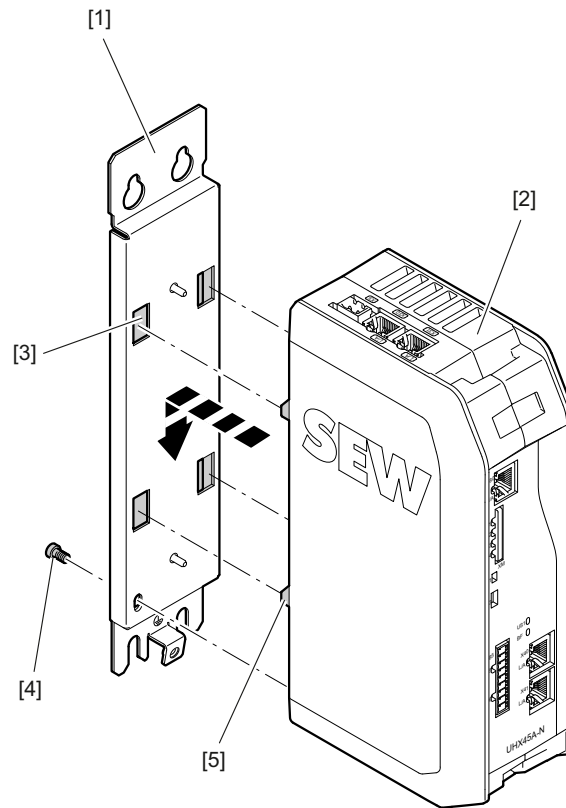


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- [1] MOVI-C® CONTROLLER
- [2] Power supply module
- [3] Axis module sizes 1

**Compact controller**

In preparation to the control cabinet installation, MOVI-C® CONTROLLER must be mounted to a carrier plate.



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- |     |                    |     |       |
|-----|--------------------|-----|-------|
| [1] | Support plate      | [4] | Screw |
| [2] | MOVI-C® CONTROLLER | [5] | Cam   |
| [3] | Recess             |     |       |

**Mounting the carrier plate**

Proceed as follows:

1. Install the housing of the MOVI-C® CONTROLLER [2] so that the cams [5] fit into the recesses [3] at the carrier plate [1].
2. Push the housing of the MOVI-C® CONTROLLER [2] downward to the stop at the cams [5].
3. Tighten the screw [4].

**Removing the carrier plate**

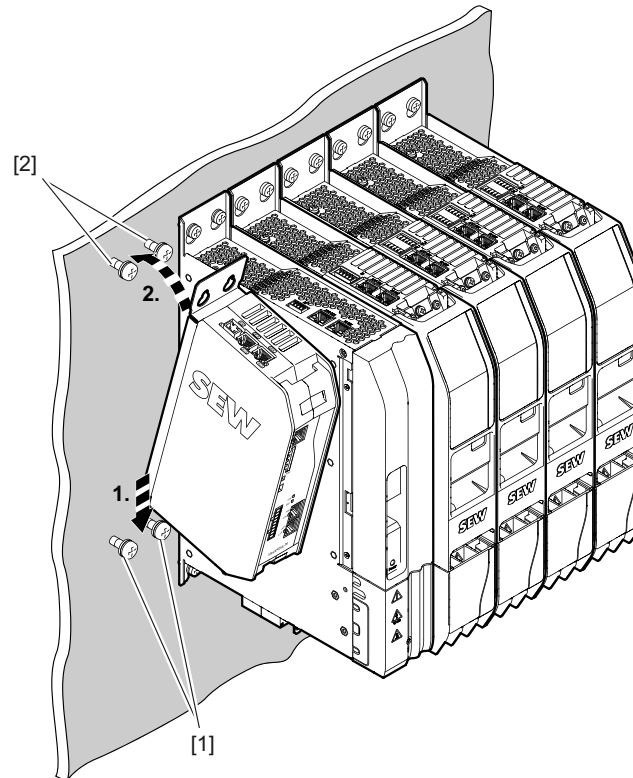
Proceed as follows:

1. Loosen the screw [4].
2. Pull the housing of the MOVI-C® CONTROLLER [2] upward and remove it toward the front.

### Inserting MOVI-C® CONTROLLER

Proceed as follows:

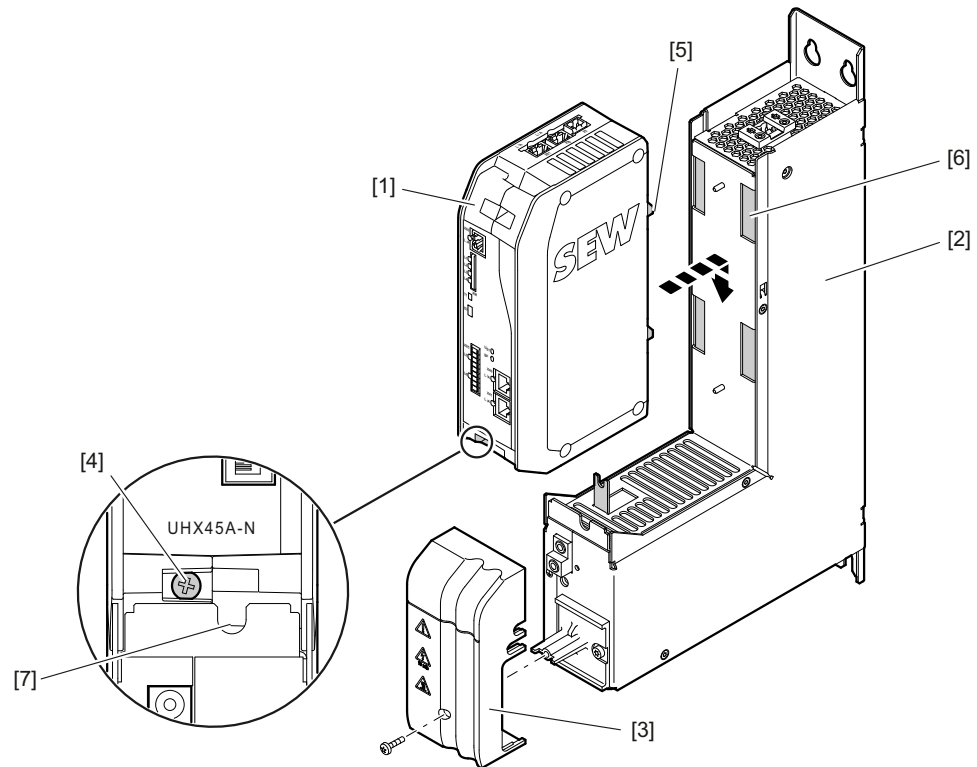
- ✓ The retaining screws [1] and [2] are screwed into the prepared mounting grid in the control cabinet but not tightened.
- 1. Place the MOVI-C® CONTROLLER with the slotted holes in the device base plate onto the retaining screws [1] from the top.



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- 2. Push the module backwards to insert the retaining screws [2] into the upper holes in the carrier plate.
- 3. Lower the module.
- 4. Tighten the retaining screws [1] and [2].

## Master module



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- |     |                    |     |                 |
|-----|--------------------|-----|-----------------|
| [1] | MOVI-C® CONTROLLER | [5] | Cam             |
| [2] | L-carrier MDM90A   | [6] | Recess for cams |
| [3] | Touch guard        | [7] | Pry-out recess  |
| [4] | Screw              |     |                 |

*Mounting the L-carrier*

Proceed as follows:

1. Remove the touch guard [3] at the housing of the L-carrier [2].
2. Install the housing of the MOVI-C® CONTROLLER [1] so that the cams [5] fit into the recesses [6] at the housing of the L-carrier [2].
3. Push the housing of the MOVI-C® CONTROLLER [1] downward until it touches the housing of the L-carrier.
4. Tighten the screw [4].
5. Install the touch guard [3] again.

*Removing the L-carrier*

Proceed as follows:

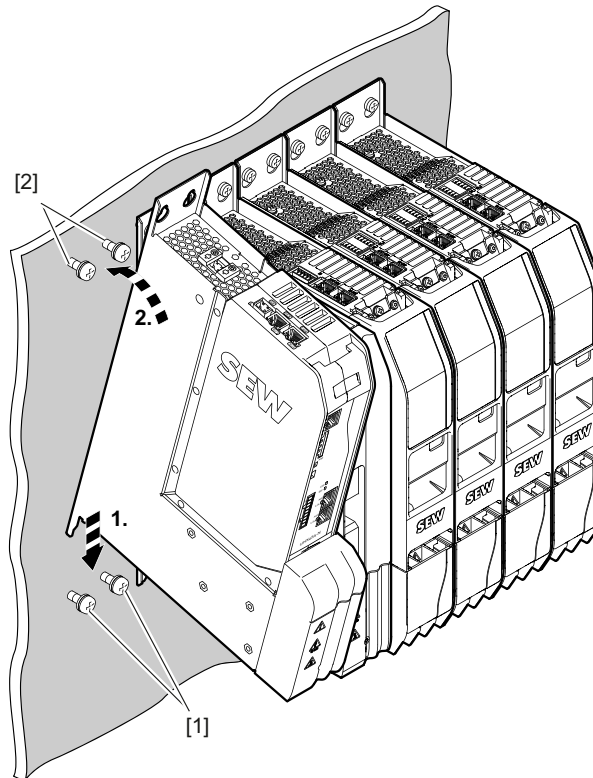
1. Remove the touch guard [3] at the housing of the L-carrier [2].
2. Loosen the screw [4].
3. Pull the housing of the MOVI-C® CONTROLLER [1] upward. Recess [7] can be used to pry out the housing if necessary.
4. Remove the MOVI-C® CONTROLLER housing to the front.

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### Inserting the master module

Proceed as follows:

- ✓ The retaining screws [1] and [2] are screwed into the prepared mounting grid in the control cabinet but not tightened.
- 1. Place the module with the slotted holes on the unit base plate onto the retaining screws [1] from the top.



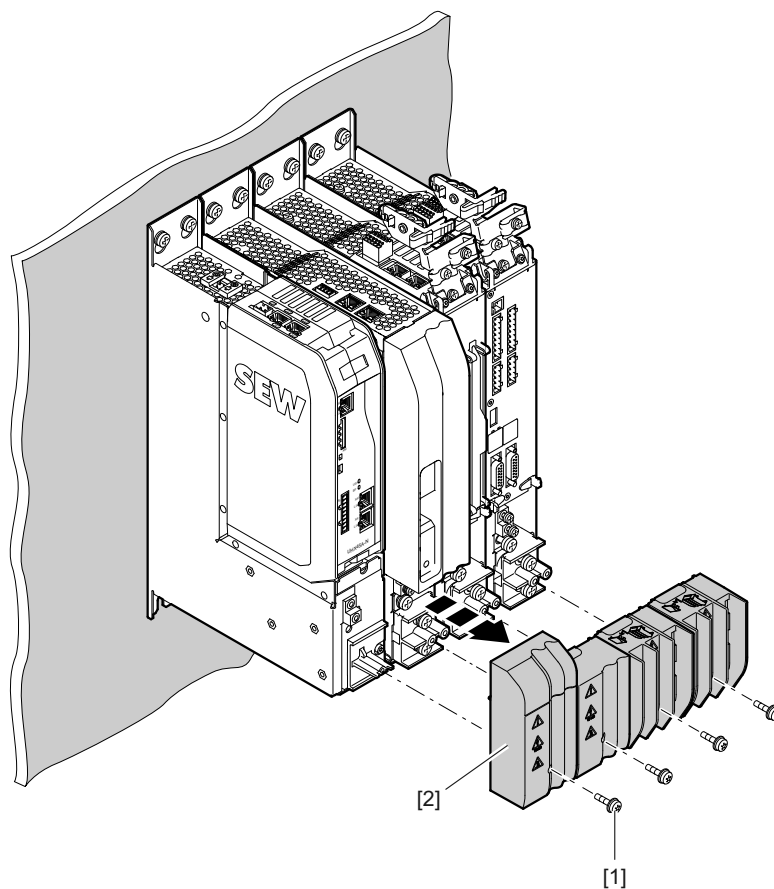
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- 2. Push the module backwards to insert the retaining screws [2] into the upper holes in the unit base plate.
- 3. Lower the module.
- 4. Tighten the retaining screws [1] and [2].

### Removing the touch guard

Proceed as follows:

1. Remove the screws [1] from the touch guard.



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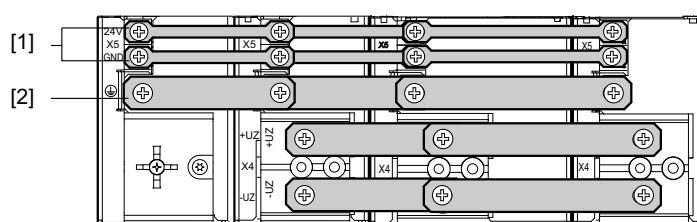
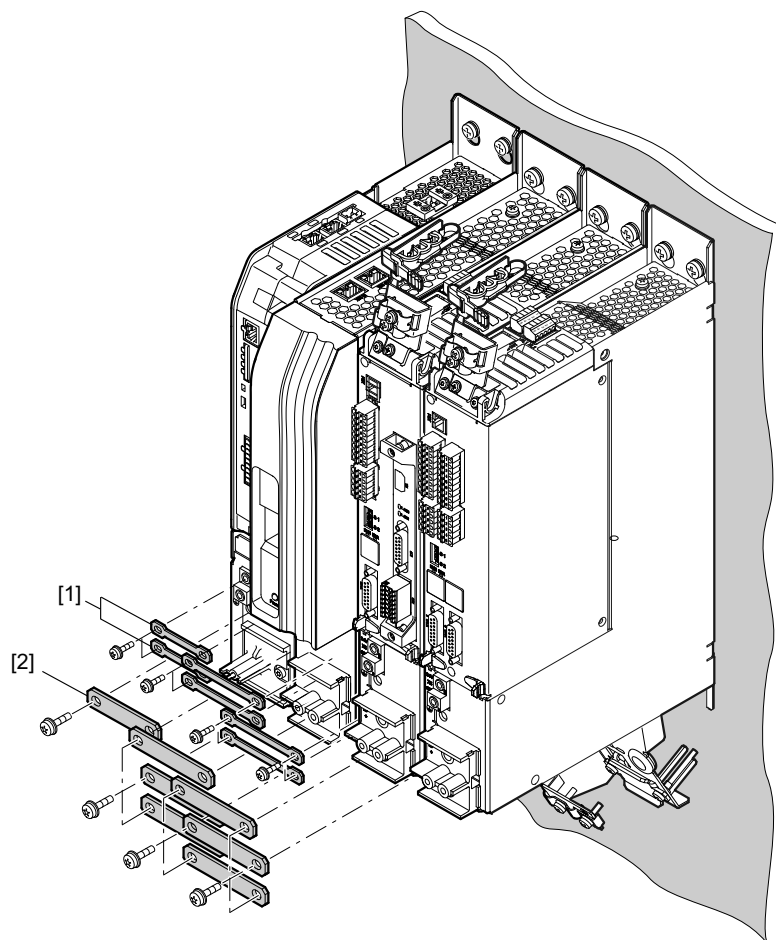
2. Remove the touch guard [2].



### Installing the busbar

Proceed as follows:

1. Install the busbar [1] for the DC 24 V supply voltage as shown in the figure. Tighten the screws with the specified tightening torque (1.2 – 1.5 Nm).



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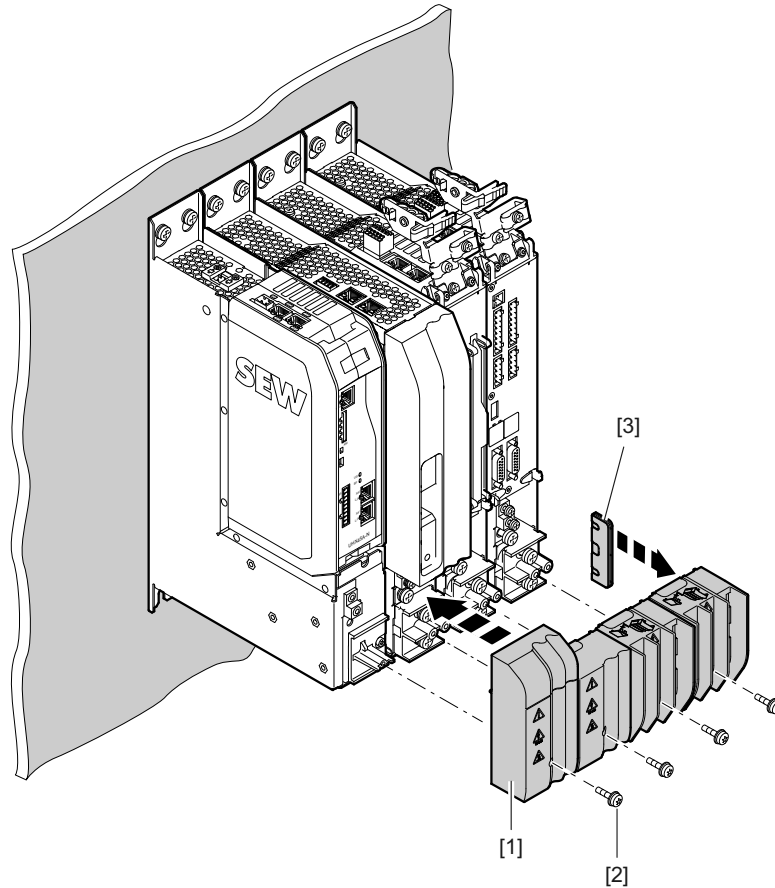
2. Install the busbar [2] for the PE connection as shown in the figure. Tighten the screws with the specified tightening torque (3 – 4 Nm).

*Installing the touch guard*

A closing cover has to be attached to the last module of the axis system.

Proceed as follows:

1. Slide the closing cover [3] onto the touch guard.

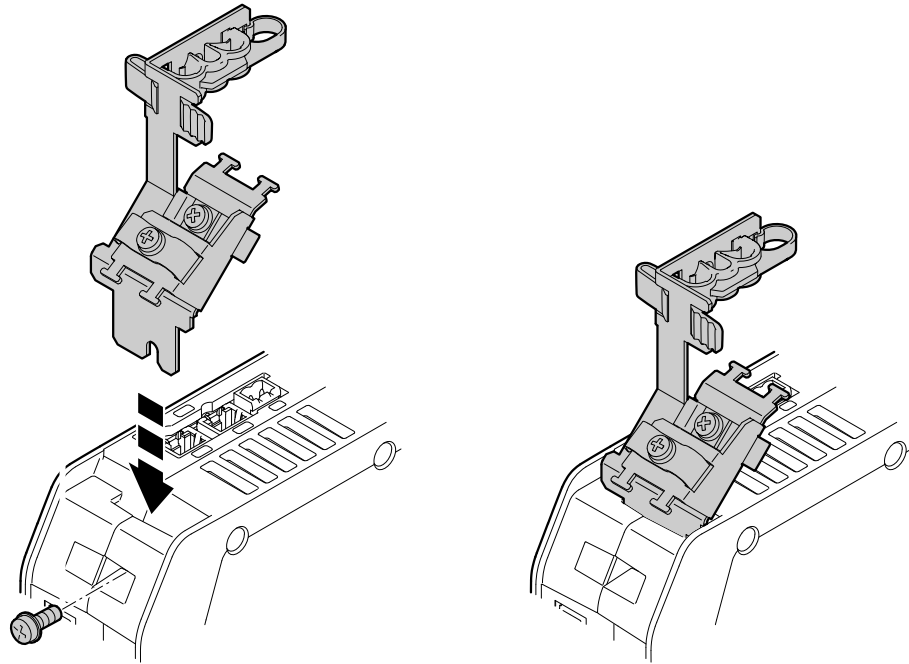


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2. Install the touch guard [1] on the module.
3. Insert the screw [2] and tighten it securely with the specified tightening torque (0.6 – 0.8 Nm).

### Top shield plate

Install the top shield plate as shown in the figure.



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### 4.3 Electrical installation

#### 4.3.1 General information



#### INFORMATION

Installation with protective separation.

The device meets all requirements for protective separation of power and electronics connections in accordance with EN 61800-5-1. The connected signal circuits have to meet the requirements according to SELV (**S**afe **E**xtr**e**mely **L**ow **V**oltage) or PELV (**P**rotective **E**xtra **L**ow **V**oltage) to ensure protective separation. The installation must meet the requirements for protective separation.



#### INFORMATION

The MOVI-C® CONTROLLER has a fused power consumption  $P_{\max} < 100 \text{ VA}$  and therefore does not require separate UL approval as an SEW inverter accessory according to UL508. If the MOVI-C® CONTROLLER is not used as an SEW inverter accessory, it must be supplied with a UL-approved class 2 power supply unit.

#### 4.3.2 Shielding and routing bus cables

#### NOTICE

Flowing compensating currents due to the incorrect cable type, inadequate shielding, and/or the incorrect routing of bus cables.

Damage to property.

- In the event of fluctuations in the ground potential, a compensating current may flow via the bilaterally connected shield that is also connected to the protective earth (PE). Make sure you always supply adequate equipotential bonding in accordance with the relevant IEC regulations.

Only use shielded cables and connection elements that meet the requirements of category 5, class D as per IEC 11801 edition 2.0.

You can take the following measures to minimize electrical interference:

- Manually tighten the retaining screws on the connectors, modules, and equipotential bonding cables.
- Use only connectors with a metal housing or a metalized housing.
- Connect the shielding in the connector over a wide surface area.
- Apply the shielding of the bus cable on both ends.
- Always route the signal and bus cables spatially separated from power cables (motor leads) and, whenever possible, in separate cable ducts.
- Use metallic, grounded cable racks in industrial environments.
- Route the signal cable and the corresponding equipotential bonding close to each other using the shortest possible route.
- Avoid using plug connectors to extend bus cables.
- Route the bus cables closely along existing grounding surfaces.

### 4.3.3 Voltage supply connection

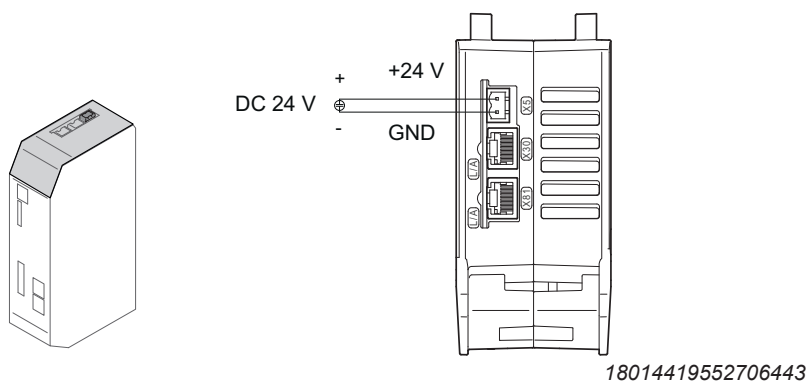
#### Compact controller

Use an external DC 24 V power supply unit for the voltage supply:

- Power consumption  $P_{\max} = 12 \text{ W}$
- Current consumption  $I_{\max} = 500 \text{ mA}$  (with DC 24 V supply voltage)

The maximum permitted length of the DC 24 V supply cable is 30 m.

#### Wiring diagram



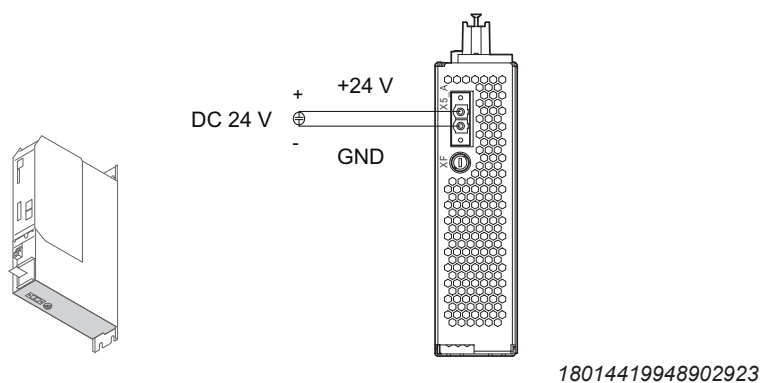
#### Master module

Use an external DC 24 V power supply unit for the voltage supply:

- Power consumption  $P_{\max} = 972 \text{ W}$
- Current consumption  $I_{\max} = 40.5 \text{ A}$  (with DC 24 V supply voltage)

The maximum permitted length of the DC 24 V supply cable is 30 m.

#### Wiring diagram



#### 4.3.4 Engineering PC connection

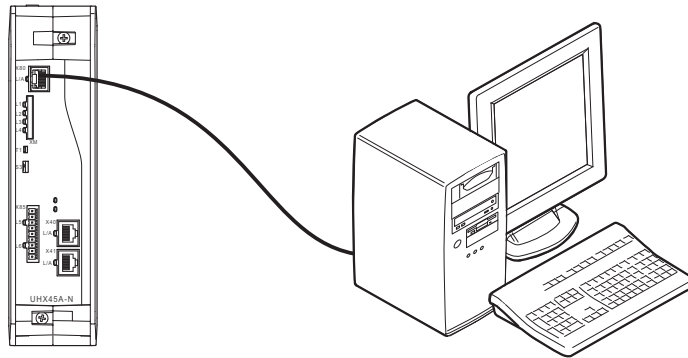
### INFORMATION



According to IEEE 802.3, 200 Edition, the maximum cable length for 10 MBaud/100 MBaud Ethernet (10BaseT/100BaseT/1000BaseT) between 2 network nodes is 100 m.

The MOVI-C® CONTROLLER is connected to the engineering interface X80 (RJ45 connector) with the engineering PC or other network stations (e.g. visualization systems). The communication is realized via Ethernet.

The device is connected to the other network nodes using a category 5, class D twisted-pair cable in accordance with IEC 11801, edition 2.0.



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In delivery state, the X80 engineering interface of the MOVI-C® CONTROLLER has the following IP address parameters:

IP address: 192.168.10.4, subnet mask: 255.255.255.0

#### 4.3.5 Connecting the fieldbus slave

### INFORMATION



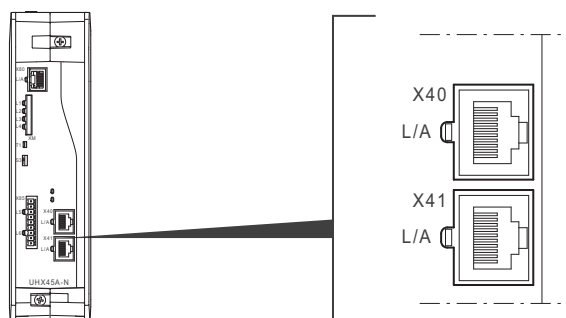
According to IEEE 802.3, 200 Edition, the maximum cable length for 10 MBaud/100 MBaud Ethernet (10BaseT/100BaseT) between 2 network nodes is 100 m.

The MOVI-C® CONTROLLER serves as a fieldbus slave for the higher-level controller (fieldbus master). The communication is realized via Ethernet.

The MOVI-C® CONTROLLER is connected to the Ethernet network via the following terminals:

- X40 (RJ45 connector)
- X41 (RJ45 connector)

The device is connected to the other network nodes using a category 5, class D twisted-pair cable in accordance with IEC 11801, edition 2.0.



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### The integrated Ethernet switch

The controller is equipped with an integrated 2-port Ethernet switch for connecting the fieldbus technology. The following network topologies are supported:

- Tree topology
- Star topology
- Line topology
- Ring topology

## INFORMATION



Note that an IEC program with a suitable fieldbus station must be loaded on the MOVI-C® CONTROLLER progressive UHX65 and MOVI-C® CONTROLLER power UHX85 to support the integrated Ethernet switch.

### Auto-crossing

The two ports leading out of the Ethernet switch have auto-crossing functionality. You can use both patch cables and crossover cables to connect to the next Ethernet node.

### Auto-negotiation

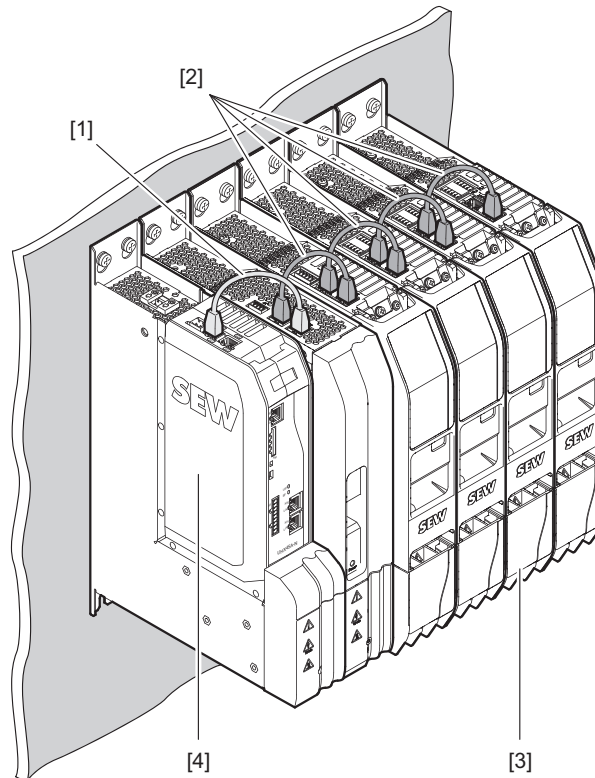
The baud rate and duplex mode are negotiated by both Ethernet nodes when establishing the connection. For this purpose, both Ethernet ports of the Ethernet connection support an auto-negotiation functionality and work with a baud rate of either 100 Mbit or 10 Mbit in full duplex mode or half duplex mode.

#### 4.3.6 EtherCAT®/SBus<sup>PLUS</sup> master connection

The MOVI-C® CONTROLLER serves as EtherCAT®/SBus<sup>PLUS</sup> master for the lower-level application inverters (EtherCAT®/SBus<sup>PLUS</sup> slaves). The communication takes place via the EtherCAT®-based, fast system bus SBus<sup>PLUS</sup> (X30).

#### EtherCAT®/SBus<sup>PLUS</sup> bus topology

EtherCAT®/SBus<sup>PLUS</sup> is designed for linear bus structure with RJ45 connectors. The EtherCAT®/SBus<sup>PLUS</sup> slave devices are connected via a shielded twisted-pair cable.



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- [1] System bus cable, 4-pin, color: light gray
- [2] Module bus cable, 8-pin, color: anthracite gray
- [3] MOVIDRIVE® modular
- [4] MOVI-C® CONTROLLER (master module)

### INFORMATION



According to IEEE 802.3, 200 Edition, the maximum cable length for 10 MBaud/100 MBaud Ethernet (10BaseT/100BaseT) between 2 EtherCAT®/SBus<sup>PLUS</sup> stations is 100 m.

#### System bus cable

### NOTICE

Malfunctions or defects in the connected devices due to the use of incorrect cables.

Damage to the product or its environment.

- Use one of the cables recommended by SEW-EURODRIVE in the chapter "Accessories" (→ 28).



## INFORMATION



The mounting plates on which the axis systems are mounted must have a sufficiently large ground connection, e.g. a ground strap.

A 4-core system bus cable is used between the MOVI-C® CONTROLLER and the other automation components (such as MOVIDRIVE® modular/system application inverters). SEW-EURODRIVE recommends using only the prefabricated cables from SEW-EURODRIVE listed in the "System bus cable" (→ 28) chapter for connecting the EtherCAT®/SBus<sup>PLUS</sup> system bus.

### Bus termination

Bus termination (for example with bus terminating resistors) is not necessary. The system detects automatically if there is no subsequent device connected to a device.

### Station address

EtherCAT®/SBus<sup>PLUS</sup> devices from SEW-EURODRIVE do not have an address that can be set for the device. The devices are detected by their position in the bus structure and are assigned an address by the EtherCAT®/SBus<sup>PLUS</sup> master.

## 4.3.7 Terminal assignment

## INFORMATION



The assignment "Reserved" means that no cable may be connected to this connection.

Representation	Terminal	Connection		Brief description	
	X5:24 V	V <sub>24 V</sub>		DC 24 V supply voltage	
	X5:GND	GND		Reference potential	
	X30			Fast system bus SBus <sup>PLUS</sup> based on EtherCAT®	
		10/100 BaseT	1000 BaseT	10/100 BaseT	1000 BaseT
	X80/X81:1	TX+	DA+	Transmit line (+)	Bidirectional pair A
	X80/X81:2	TX-	DA-	Transmit line (-)	Bidirectional pair A
	X80/X81:3	RX+	DB+	Receive line (+)	Bidirectional pair B
	X80/X81:4	Reserved	DC+	–	Bidirectional pair C
	X80/X81:5	Reserved	DC-	–	Bidirectional pair C
	X80/X81:6	RX-	DB-	Receive line (-)	Bidirectional pair B
	X80/X81:7	Reserved	DD+	–	Bidirectional pair D
	X80/X81:8	Reserved	DD-	–	Bidirectional pair D
	X40/X41:1	TX+		Transmit line (+)	
	X40/X41:2	TX-		Transmit line (-)	
	X40/X41:3	RX+		Receive line (+)	
	X40/X41:4	Reserved		–	
	X40/X41:5	Reserved		–	
	X40/X41:6	RX-		Receive line (-)	
	X40/X41:7	Reserved		–	
	X40/X41:8	Reserved		–	
	X85:1	DGND-II		RS485 reference potential	
	X85:2	RS485 + (insulated)		RS485 signal line (-)	
	X85:3	RS485 - (insulated)		RS485 signal line (+)	
	X85:4	DGND-I		CAN 1 reference potential (internally connected to PE)	
	X85:5	CAN 1 H (insulated)		CAN 1 high (galvanically isolated)	
	X85:6	CAN 1 L (insulated)		CAN 1 low (galvanically isolated)	
	X85:7	DGND		CAN 2 reference potential	
	X85:8	CAN 2 H		CAN 2 high	
	X85:9	CAN 2 L		CAN 2 low	

5 Startup

5.1 Setting an IP address (optional)

If you want to use an IP address other than the default IP address (192.168.10.4) for communication, you can change the IP address using one of the following methods.

5.1.1 Via MOVISUITE®

The IP address for communication can be changed directly in the configuration of the MOVI-C® CONTROLLER in MOVISUITE®. Proceed as follows:

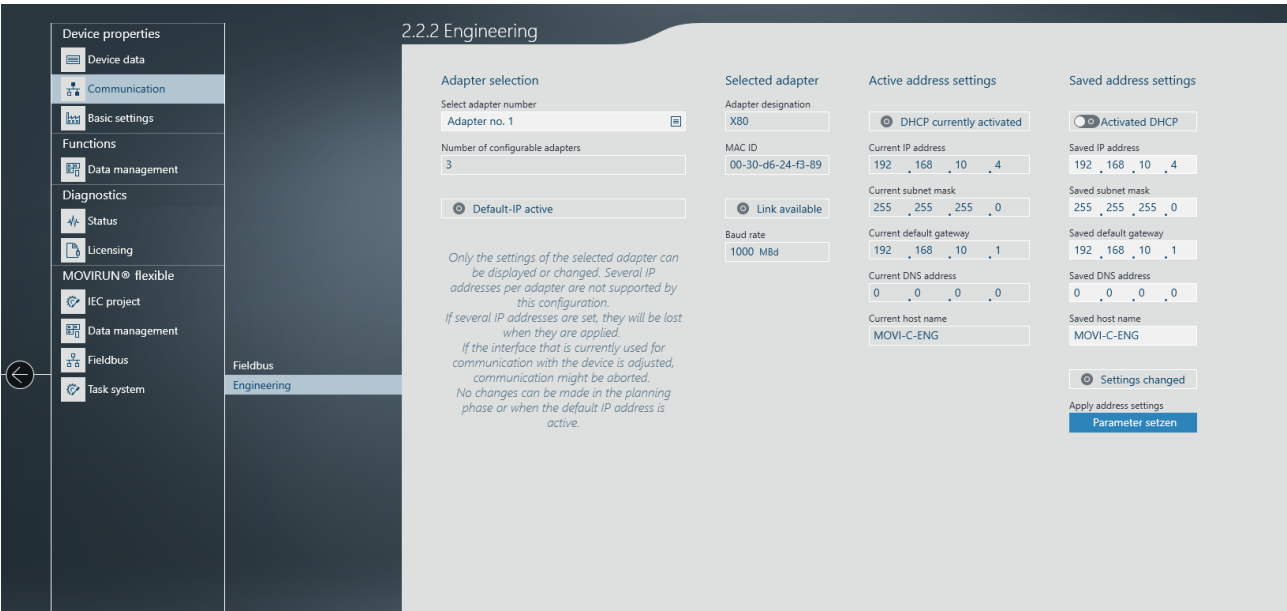
INFORMATION



When using this function to set the IP address, the specified IP address is written directly to FRAM only. If a SewPlcIp.xml file exists in the "System" directory on the MOVI-C® CONTROLLER, the IP address declared in the SewPlcIp.xml file is adopted the next time the MOVI-C® CONTROLLER is switched on.

- Access the file system on the MOVI-C® CONTROLLER via the engineering interface or using a card reader, navigate to the "System" directory and check if the SewPlcIp.xml file exists. If you always want to set the IP address via MOVISUITE® in the future, delete the file or rename the file.

1. In MOVISUITE®, open the configuration of the MOVI-C® CONTROLLER.
2. In the "Communication" configuration menu, open the submenu "Engineering".
3. Enter the required IP address data in the "Saved address settings" area.



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4. Click [Set parameter].


## 5.1.2 Via file system

## INFORMATION




If necessary, switching between default address and user-defined IP address is performed via the integrated DIP switch.

The MOVI-C® CONTROLLER reads the IP address for communication from the `SewPlcIp.xml` file in the "System" directory of the OMH memory card of the MOVI-C® CONTROLLER. You can adjust this file manually to change the IP address. Proceed as follows:

1. Access the file system on the MOVI-C® CONTROLLER via the engineering interface or using a card reader and navigate to the "System" directory.
  2. Open the `SewPlcIp.Example.xml` file for editing in an editor.
  3. In the file, replace the currently specified IP addresses with the ones you require.
  4. Save the file and close the editor.
  5. Rename the edited file into `SewPlcIp.xml`.
- ⇒ The new values are applied and used the next time the MOVI-C® CONTROLLER is started up.
- ⇒ After the first startup after processing, the `SewPlcIp.xml` file should be deleted or renamed to `SewPlcIp.Example.xml` to allow the IP address to be changed via the configuration MOVI-C® CONTROLLER in MOVISUITE®. See also the information in chapter "Via MOVISUITE®" (→  47).
- INFORMATION:** When the file is deleted, the default address (192.168.10.4) is not set again automatically.

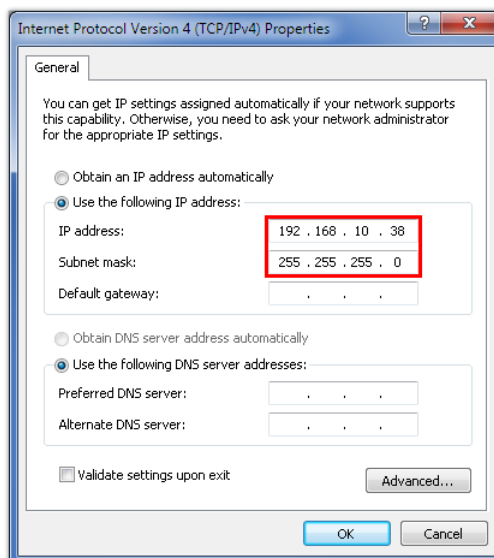
## 5.2 Connecting engineering PC and MOVI-C® CONTROLLER

To ensure that the engineering PC can communicate via the X80 engineering interface with the MOVI-C® CONTROLLER via Ethernet, both the devices must be connected in the same local network. For this purpose, the IP address parameters of the engineering PC must be set to the local network. The default IP address(es) of the Ethernet communication interface(s) can be found in the chapter "Connecting the engineering PC" (→  42).

Proceed as follows:

1. Open the settings for the network via the Windows control panel.
2. Double-click on the adapter that is physically connected to the X80 engineering interface of the MOVI-C® CONTROLLER.

3. Select the Internet protocol version 4 "TCP/IPv4" in the adapter properties.
4. Enter the IP address parameters of the engineering PC in the Internet protocol properties. Note that the IP address of the engineering PC is different from the IP address of all other network stations and is therefore unique. The network address (here the first 3-address blocks) for all network stations must be identical and the station address (here the last address block) of the engineering PC must be different from the network address of all other stations.



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⇒ In this example, the IP address of the engineering PC is 192.168.10.38

### 5.3 Inserting devices in MOVISUITE®

#### INFORMATION

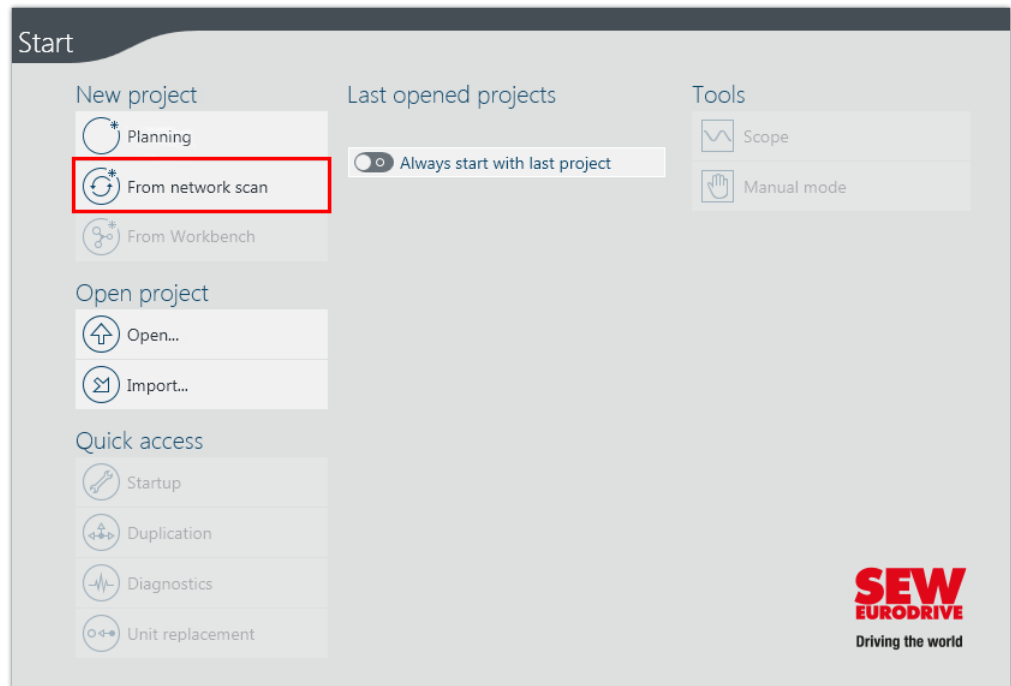


For detailed information on how to use the MOVISUITE® engineering software, refer to the corresponding documentation.

Proceed as follows:

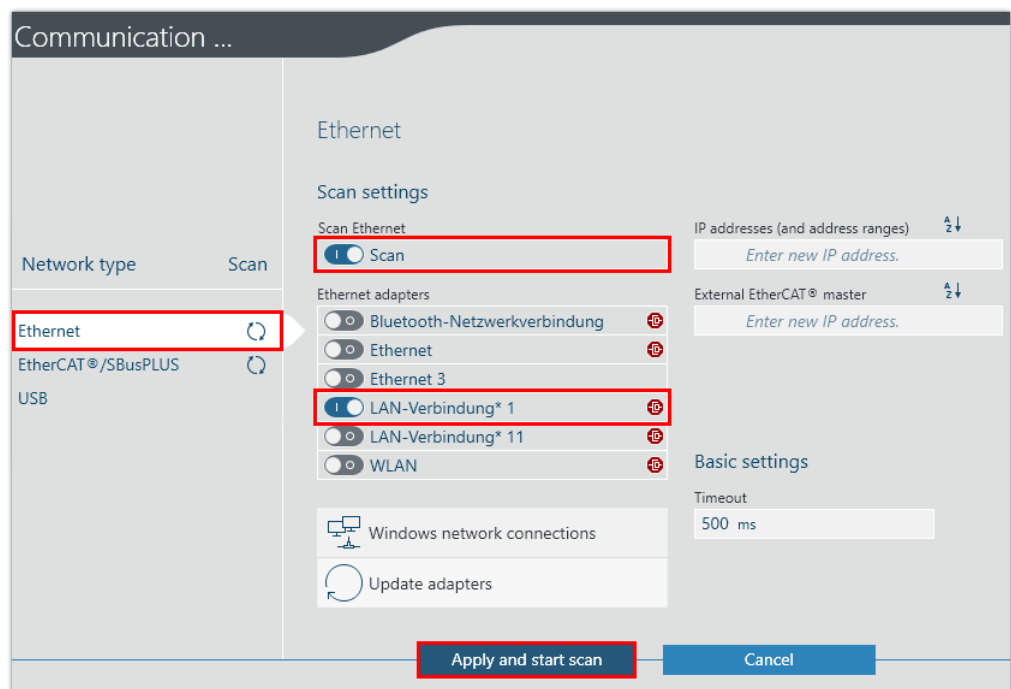
- ✓ The engineering PC and the MOVI-C® CONTROLLER are connected via the (X80) engineering interface.
  - ✓ Both devices are connected in the same local network and the IP address parameters of the engineering PC are set to the local network.
1. Start the MOVISUITE® engineering software.

2. Create a new MOVISUITE® project from a network scan.



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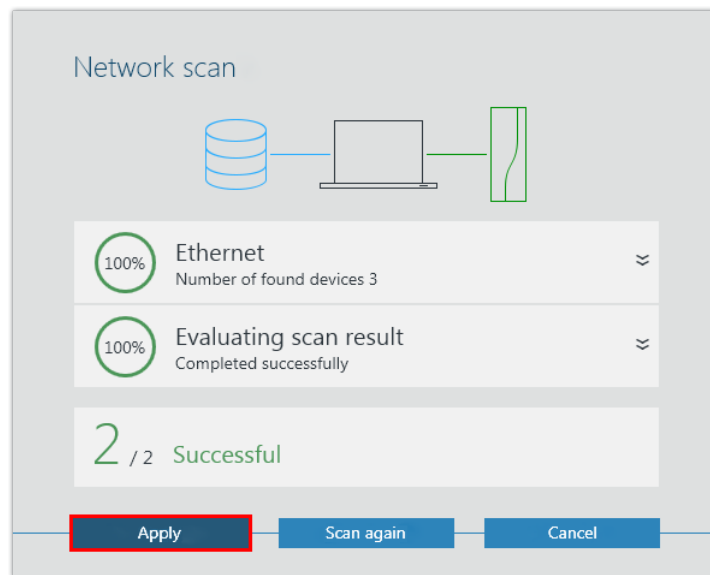
3. Select the network type (Ethernet) and activate the configured adapter (LAN connection). Apply the settings and perform the network scan.



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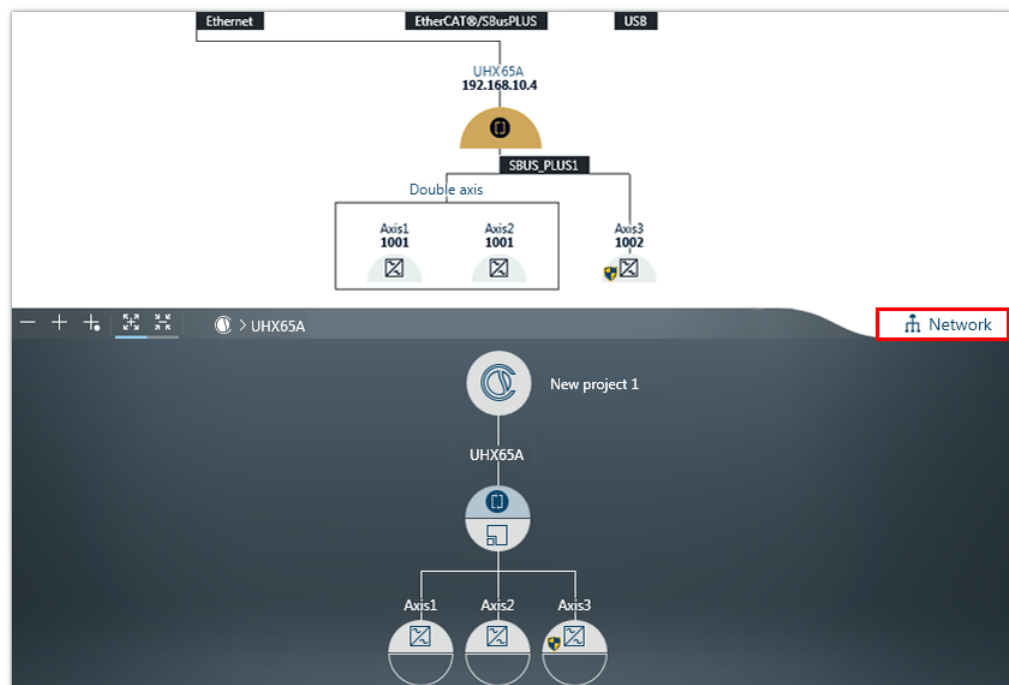
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4. Apply the scanned devices to MOVISUITE®.



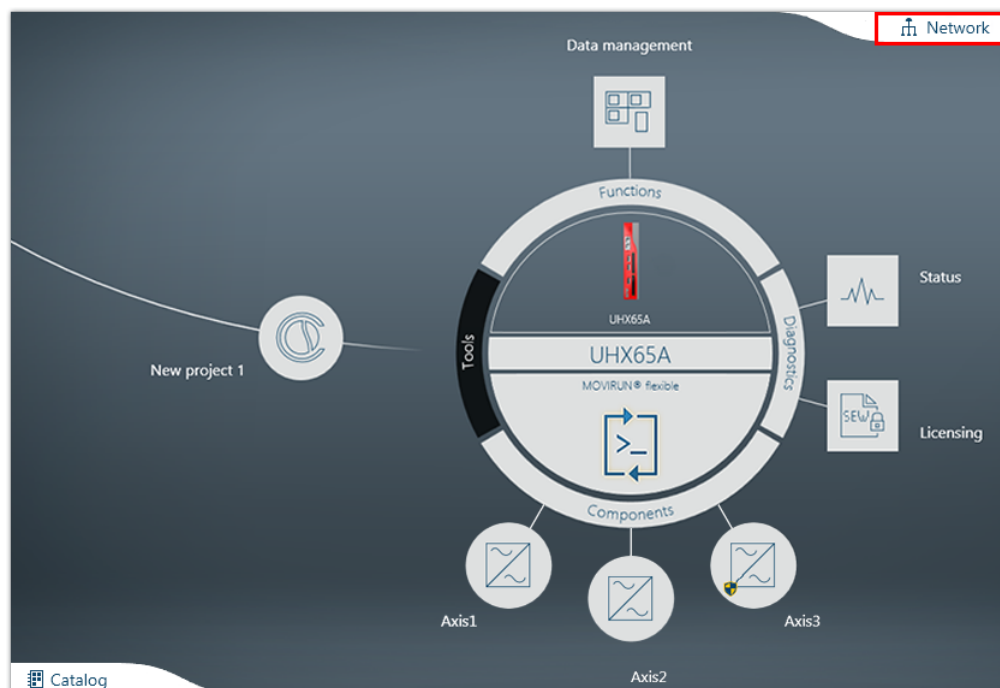
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5. If necessary, load the device data into the MOVISUITE® project. Confirm the message stating that the device data has been successfully transferred.
  - ⇒ The devices are displayed in one of the MOVISUITE® views. **INFORMATION:** The display depends on the view you used when closing MOVISUITE® for the last time.
  - ⇒ The combined network and function view shows all connected devices detected during the network scan.



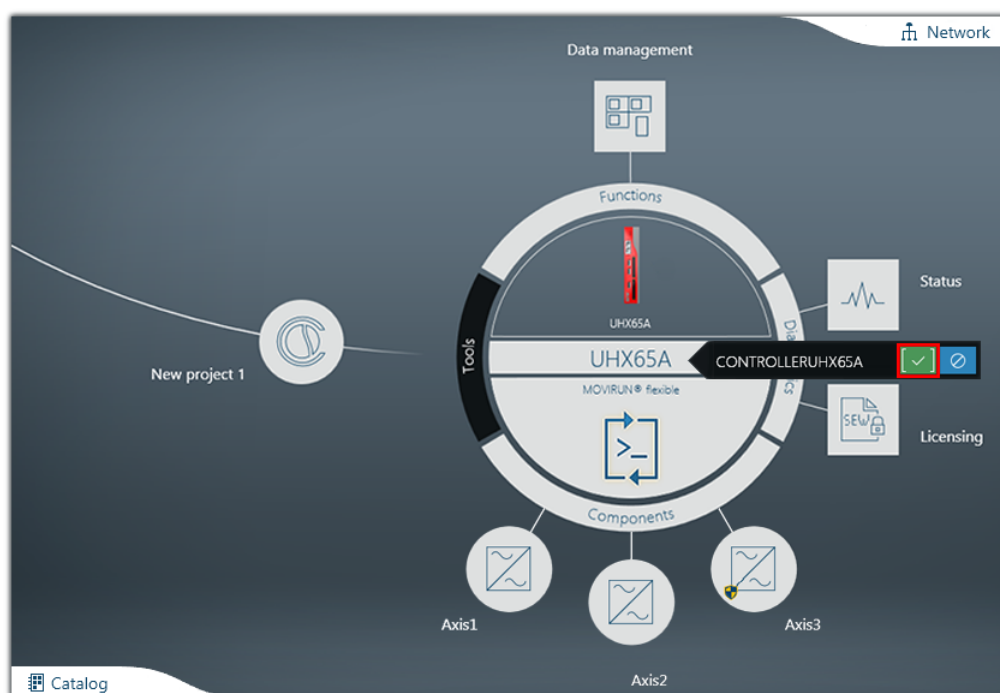
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- ⇒ The function view has 2 views. The tree view provides an overview of the entire project. The circle view shows the current node as a large circle in the center of the workspace.



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6. To toggle between the MOVISUITE® views, click the "Network" tab.
7. Enter a name for the MOVI-C® CONTROLLER. The device will then be shown in the MOVISUITE® project under this name.



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- ⇒ The MOVI-C® CONTROLLER has the following device name in this example:  
CONTROLLERUHX45A
8. Save the MOVISUITE® project.



## 6 Operation

### 6.1 IT security

#### 6.1.1 Hardening measures




Perform the following hardening measures:

- Regularly check if updates are available for your products.
- Report incidents concerning IT security by e-mail to [cert@sew-eurodrive.com](mailto:cert@sew-eurodrive.com).
- Regularly check which Security Advisories are available in the Online Support of SEW-EURODRIVE.
- Evaluate the error memories and diagnostics information of your products regularly and check whether there are entries that affect IT security.

#### 6.1.2 Guidelines for secure operation



The engineering protocol from SEW-EURODRIVE allows authorized personnel to activate various service accesses on the device. Authentication is implemented by using static access data. This data is not used to defend against attacks on IT security but to protect against unintentional modification. This is the reason why they cannot be changed.

To prevent misuse of these service accesses, network access must be restricted according to the state of the art. For more information, refer to section "IT security of the environment" (→  13).

#### 6.1.3 Guidelines for user account management



The device has no user accounts.

### 6.2 Logging function

The MOVI-C® CONTROLLER has a logging function, for example, to track the processing procedures in the event of an error. The logging function is disabled by default.

#### INFORMATION



To keep the write operations on the memory card low and in this way prevent a defect, the logging function should not be activated permanently.

To activate the logging function, do the following:

1. On your engineering PC connected to the MOVI-C® CONTROLLER, open the OMH memory card content using a file explorer.
2. Navigate to the "log" directory on the OMH memory card.
  - ⇒ The "log" directory contains the `LogConfig.Example.xml` file.
3. Rename the `LogConfig.Example.xml` file into `LogConfig.xml`.
  - ⇒ The logging function is now active.

### 6.3 Use of retain/PERSISTENT variables

RETAIN/PERSISTENT variables can keep their value beyond the standard program runtime. This is why they are used in the IEC program to save values in a power failure-safe manner. The memory area required for using the RETAIN/PERSISTENT variables is available on the MOVI-C® CONTROLLER. See chapter "Technical data" (→ 68).

RETAIN variables retain their value after an uncontrolled exit (or online command `Reset warm`). RETAIN variables are initialized with the `Reset origin` command, the `Reset cold` command, and a new program download.

PERSISTENT variables keep their values warm in case of a `Reset cold`, when the application is downloaded again, and during a reset warm. This means that PERSISTENT variables are only re-initialized with `Reset origin`.

The following table provides an overview of whether the variable type keeps its value for certain commands (x) or whether the variable is initialized (i).

Action in the IEC menu "Online"	Neither RETAIN nor PERSISTENT	RETAIN	RETAIN PERSISTENT
Online change	x	x	x
Reset warm	i	x	x
Reset cold	i	i	x
Load	i	i	x
Reset original	i	i	i

#### 6.3.1 Adding RETAIN/PERSISTENT variables

To add RETAIN/PERSISTENT variables at the corresponding position in the device tree, open the context menu and select "Persistent variables..." in the "Add object" submenu. This adds a corresponding object to the device tree that you can fill with your variables.

Observe the following notes when using RETAIN/PERSISTENT variables.

- RETAIN/PERSISTENT variables are stored in FRAM. As the FRAM is 10x slower than the RAM, you should avoid using RETAIN/PERSISTENT variables in the TaskPrio.
- If RETAIN/PERSISTENT variables are used in a task, the task creates a copy of the data for reading, writing and executing the program at the start of the cycle and then copies the data back to the FRAM. For this reason, you should avoid using a RETAIN/PERSISTENT variable in more than one task because the data is always overwritten by the later task.
- You should avoid using function blocks with local RETAIN variables because in this case the entire function block runs in the RETAIN memory. This makes the execution very slow and wastes memory space.

#### 6.3.2 Cleaning up the PERSISTENT memory

After changing PERSISTENT variables, the PERSISTENT memory may be completely filled even though only a few PERSISTENT variables are used. In this case, the PERSISTENT memory should be reorganized. The reorganization removes gaps that have occurred when changing declarations of PERSISTENT variables and thus reduces the memory requirement.

Proceed as follows:

1. Double-click the added "Persistent variables" object in the device tree.  
⇒ The "Declarations" menu is displayed in the menu bar.
2. Open the "Declarations" menu and click on the entry [Reorder list and clean up gaps].

### 6.3.3 Saving and restoring the RETAIN/PERSISTENT memory

During the "Device replacement" (→ 58), the RETAIN/PERSISTENT variables are not saved and restored. The RETAIN/PERSISTENT variables must be saved and restored manually as described below.

## INFORMATION



To execute the corresponding command, the program must be stopped. The RETAIN/PERSISTENT memory can be saved without a login.

To save the RETAIN/PERSISTENT memory (or optionally from a specific program), execute the following command in the configuration of the MOVI-C® CONTROLLER in the IEC Editor in the "PLC Shell" tab:

```
saveretains [<applicationname>]
```

To restore the RETAIN/PERSISTENT memory (or optionally from a specific program), execute the following command in the communication settings of the MOVI-C® CONTROLLER in the IEC Editor in the "PLC Shell" tab:

```
restoreretains [<applicationname>]
```

## 6.4 Fault description

### 6.4.1 Fault 150 Controller firmware – general device fault

Subfault: 150.1		
Description: Unknown fault		
	Response: No response	
	Cause	Measure
	The firmware of the MOVI-C® CONTROLLER detected a severe fault that cannot be attributed to a precise device fault.	<p>– Activate the function that the log books are stored in the file system of the MOVI-C® CONTROLLER. Check the entries with the severity "Fault" or "Exception" in the log books for further information.</p> <p>– Acknowledge the fault. The MOVI-C® CONTROLLER is restarted.</p> <p>– If the fault occurs repeatedly, contact SEW- EURODRIVE Service.</p>

**Subfault: 150.2****Description: Restart after exception handling**

Response: No response		
	Cause	Measure
	The MOVI-C® CONTROLLER has performed exception handling due to unauthorized access to the memory with subsequent restart.	<ul style="list-style-type: none"> <li>– Activate the function that the log books are stored in the file system of the MOVI-C® CONTROLLER. Check the entries with the severity "Fault" or "Exception" in the log books for further information.</li> <li>– Acknowledge the fault. The MOVI-C® CONTROLLER is restarted.</li> <li>– If the fault occurs repeatedly, contact SEW- EURODRIVE Service.</li> </ul>

**Subfault: 150.3****Description: Faulty booting**

Response: No response		
	Cause	Measure
	Failed to start the MOVI-C® CONTROLLER properly. The configuration of the firmware of the MOVI-C® CONTROLLER is incorrect or corrupt.	<ul style="list-style-type: none"> <li>– Activate the function that the log books are stored in the file system of the MOVI-C® CONTROLLER. Check the entries with the severity "Fault" or "Exception" in the log books for further information.</li> <li>– Acknowledge the fault. The MOVI-C® CONTROLLER is restarted.</li> <li>– If the fault occurs repeatedly, contact SEW- EURODRIVE Service.</li> </ul>

**Subfault: 150.4****Description: Fault in early booting phase**

Response: No response		
	Cause	Measure
	The MOVI-C® CONTROLLER could not start properly due to errors in the early start phase.	<ul style="list-style-type: none"> <li>– Activate the function that the log books are stored in the file system of the MOVI-C® CONTROLLER. Check the entries with the severity "Fault" or "Exception" in the log books for further information.</li> <li>If the software packages are corrupt, load original SEW-EURODRIVE software packages onto the removable storage device again.</li> <li>– Acknowledge the fault. The MOVI-C® CONTROLLER is restarted.</li> <li>– If the fault occurs repeatedly, contact SEW- EURODRIVE Service.</li> </ul>

#### 6.4.2 Fault 151 controller firmware – License Manager fault

<b>Subfault: 151.1</b>		
<b>Description: License Manager not working properly</b>		
	Response: No response	
	Cause	Measure
	An internal software error has been detected.	Contact SEW-EURODRIVE Service.

## 7 Service

### 7.1 Electronics Service by SEW-EURODRIVE

If you are unable to rectify a fault, contact SEW-EURODRIVE Service. For addresses, refer to [www.sew-eurodrive.com](http://www.sew-eurodrive.com).

When contacting SEW-EURODRIVE Service, always specify the following information so that our service personnel can assist you more effectively:

- Information regarding the device type on the nameplate (e.g. type designation, serial number, part number, product key, purchase order number)
- Brief description of the application
- Fault message on the status display
- Nature of the fault
- Accompanying circumstances
- Unusual events preceding the problems

### 7.2 Device replacement

#### INFORMATION



When replacing a MOVI-C® CONTROLLER, observe the information in the "Installation" (→ 29) chapter and the "Safety notes" (→ 9).

#### INFORMATION



For information on replacing the drives, refer to the manual of the corresponding application inverter.

#### INFORMATION



The variable values permanently stored on the MOVI-C® CONTROLLER are not stored on the OMH memory card by default. To store the variable values on the OMH memory card, program a corresponding IEC program.

Do the following when replacing a MOVI-C® CONTROLLER:

1. In MOVISUITE®, open the configuration of the MOVI-C® CONTROLLER.
2. Open the "Data management" submenu.
3. Under "Configuration data", enable the "Controller replacement function".
4. Click on the [Update configuration data] button.
  - ⇒ The current failsafe data of the MOVI-C® CONTROLLER is stored once on the OMH memory card. All of the data that is required when replacing the MOVI-C® CONTROLLER is in this way stored on the OMH memory card so that the system can run again in the same way as before the replacement. A detailed list of the stored data can be found in the table below. This information may vary depending on the firmware version.

## INFORMATION



The PROFINET device name is not saved and restored. To save the PROFINET device name, assign the name via the control software of the PLC or perform a topology-based naming so that the PLC project assigns the name automatically.

NV data	Category
IP settings	Backup and restore
IEC settings	Backup and restore
Customer-specific device designation	Backup and restore
Fieldbus parameters	Backup and restore
Time/date settings	Backup and restore
Device faults and info	Backup only, no restore
Device faults and info	Backup only, no restore
IEC RETAIN/PERSISTENT	Not backed up. To back up this data, contact SEW-EURODRIVE Service. See also "Saving and restoring the RETAIN/PERSISTENT memory" (→ 55).

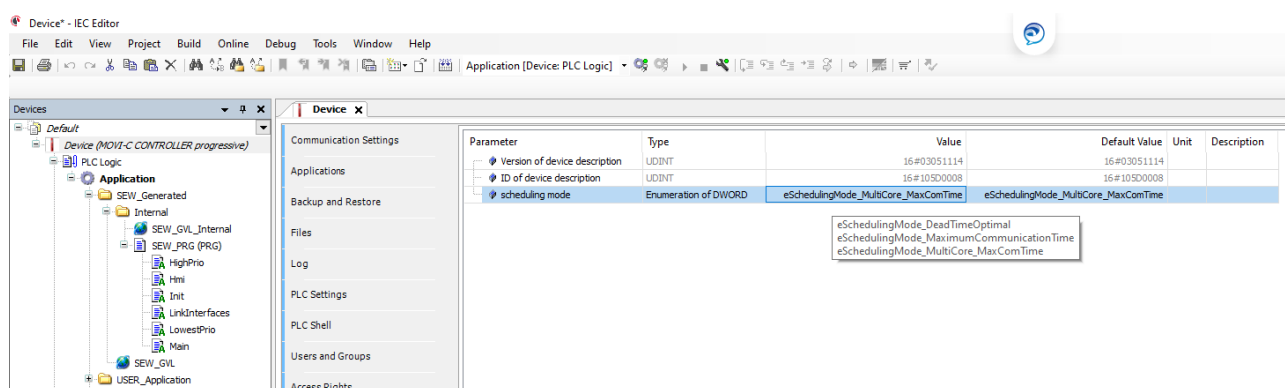
- Insert the OMH memory card of the MOVI-C® CONTROLLER to be replaced into the corresponding card slot of the new MOVI-C® CONTROLLER.
  - ⇒ The most recently failsafe data is transferred from the OMH memory card to the MOVI-C® CONTROLLER.

## 7.3 Program transfer

If a program is loaded from an older MOVI-C® CONTROLLER (firmware older than version 2.10) to a newer one, it does not start due to a different setting of the scheduling mode ("MaximumCommunicationTime" instead of "MultiCore\_MaxComTime"). In this case, the scheduling mode of the MOVI-C® CONTROLLER must be set from "MaximumCommunicationTime" to "MultiCore\_MaxComTime".

Proceed as follows to adjust the scheduling mode:

- In the IEC Editor, open the configuration of the MOVI-C® CONTROLLER.
- In the configuration of the MOVI-C® CONTROLLER, open the "Parameter" tab.



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- Set the "Scheduling mode" parameter to the value "Multicore\_MaxComTime".

4. Save the IEC project.
5. Restart the MOVI-C® CONTROLLER.



## 7.4 Firmware update

The methods described in the following chapters are available for updating the firmware of the MOVI-C® CONTROLLER.

### 7.4.1 Via MOVISUITE®

#### INFORMATION

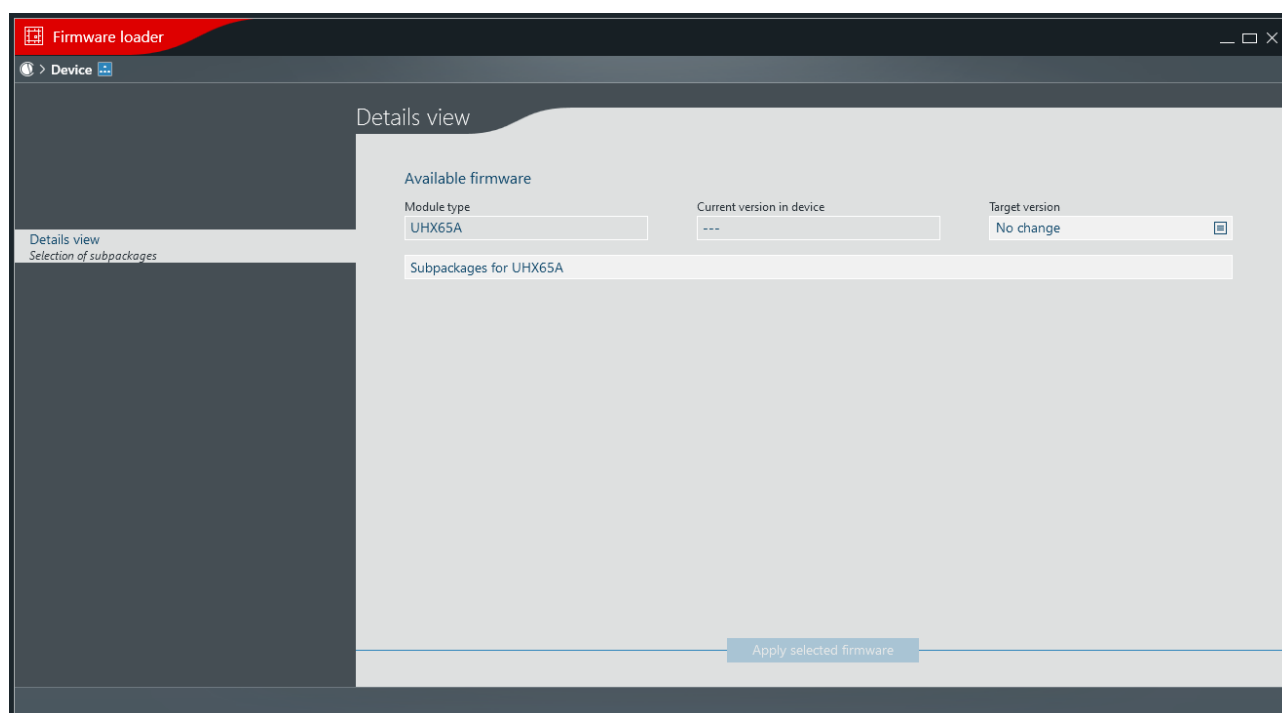


The tool is only available with permission level "advanced".

The "Firmware loader" tool is available in MOVISUITE® to change the firmware version.

Proceed as follows to change the firmware:

1. Open the context menu of the MOVI-C® CONTROLLER in the MOVISUITE® project.
2. In the "Tools" submenu, select the "Firmware loader" menu entry.  
⇒ The "Firmware loader" tool opens.



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3. In the "Target version" drop-down list, select the firmware version to be applied.
4. Click [Apply selected firmware].

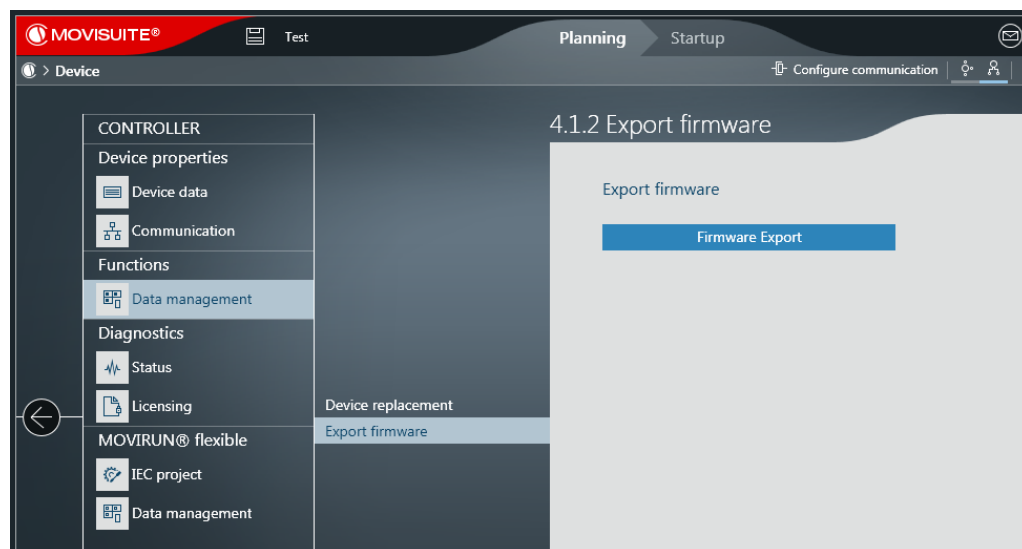
### 7.4.2 Via file system

The firmware of the MOVI-C® CONTROLLER can be updated manually via the file system as follows.

#### Exporting a firmware image

1. Create a new project in MOVISUITE® via "Planning" in the "Start" menu.

2. In the function view of the MOVISUITE® project, add the required MOVI-C® CONTROLLER in the required version.
3. Select the MOVI-C® CONTROLLER in the MOVISUITE® project.
  - ⇒ The configuration menu of the MOVI-C® CONTROLLER opens.
4. In the "Functions" section, open the "Data management" submenu and the "Export firmware" menu.



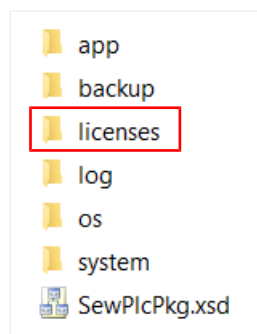
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5. Click the [Firmware export] button in the "Export firmware" menu.
  - ⇒ A dialog opens where you can select the export directory.
6. Navigate to the export directory and confirm your selection by clicking [OK].
  - ⇒ The firmware of the MOVI-C® CONTROLLER is saved as a ZIP file (file name: FS.zip) in the selected export directory.

### Copying a firmware image to the OMH memory card

- ✓ The steps described in chapter "Exporting a firmware image" (→ 61) have been performed. The firmware image of the MOVI-C® CONTROLLER is located on your computer as a ZIP archive.
1. Remove the OMH memory card from the MOVI-C® CONTROLLER.
  2. To read the data stored on the OMH memory card, insert the card in a card reader connected to your computer. You can also use another suitable interface of your computer.

3. On your computer, use a file explorer to open the contents of the OMH memory card.
  - ⇒ The "licenses" directory on the OMH memory card contains the SEW license file. To ensure that the licenses you have purchased remain valid, the SEW license file must again be contained in a "licenses" directory on the OMH memory card after the firmware update.



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4. To save your license files, copy the "licenses" directory locally to your computer.
5. Delete all files on the OMH memory card.
6. Unzip the ZIP archive of the required firmware image onto the OMH memory card. For more information on the export, refer to chapter "Exporting a firmware image" (→ 61).
7. From the "licenses" directory copied locally to your computer, copy the SEW license file to the "licenses" directory on the OMH memory card.

## INFORMATION



Restoring the "licenses" directory after deleting the OMH memory card is also possible via the MOVISUITE® License Manager. For this purpose, carry out the following steps:

- ✓ Engineering PC and MOVI-C® CONTROLLER are connected.
- ✓ The engineering PC is connected to the Internet.
- Insert the OMH memory card into the MOVI-C® CONTROLLER.
- Open the License Manager via the context menu of the MOVI-C® CONTROLLER in MOVISUITE® in the "Tools" menu.
- Click on [Transfer licenses to the MOVIC® CONTROLLER].

- ⇒ The firmware has been updated. Now you can create a new MOVISUITE® project.

## 7.5 Waste disposal

Dispose of the product and all parts separately in accordance with their material structure and the national regulations. Put the product through a recycling process or contact a specialist waste disposal company. If possible, divide the product into the following categories:

- Iron, steel or cast iron
- Stainless steel
- Magnets
- Aluminum
- Copper
- Electronic parts
- Plastics

The following materials are hazardous to health and the environment. These materials must be collected and disposed of separately.

- Oil and grease

Collect used oil and grease separately according to type. Ensure that the used oil is not mixed with solvent. Dispose of used oil and grease correctly.

- Screens
- Capacitors
- Rechargeable batteries
- Batteries



### Waste disposal according to WEEE Directive 2012/19/EU

This product and its accessories may fall within the scope of the country-specific application of the WEEE Directive. Dispose of the product and its accessories according to the national regulations of your country.

For further information, contact the responsible SEW-EURODRIVE branch or an authorized partner of SEW-EURODRIVE.



### Waste disposal according to the Battery Directive 2006/66/EC

This product contains batteries or accumulators. Dispose of this product and the batteries or accumulators separately from the municipal waste according to the national regulations.

## 7.6 IT security

### 7.6.1 IT security guidelines for secure disposal

#### Removing the product from its intended environment



If the data stored on the product are considered relevant for IT security, remove them as described in the section "Secure removal of data stored in the product." (→ 65)

### Removing reference and configuration data in the environment



Reference files, configuration files, log files, and other data belonging to the product can be stored in the environment on other devices, such as a higher-level controller or a local OPC-UA client. If the stored data is considered relevant for IT security, remove it from the corresponding devices.

### Secure removal of data stored in the product



If the data stored locally on the product is classified as relevant for IT security, contact the responsible SEW-EURODRIVE Service department for safe removal.











### Removing a customer data backup



The product does not create local customer data backups.

## 8 Technical data

### 8.1 Markings

Mark	Definition
	The CE mark states compliance with the following European directives: <ul style="list-style-type: none"> <li>• Low Voltage Directive 2014/35/EU</li> <li>• EMC Directive 2014/30/EU</li> <li>• Machinery Directive 2006/42/EC</li> <li>• Directive 2011/65/EU for limiting the use of certain hazardous substances in electrical and electronic equipment</li> </ul>
	The RCM mark declares compliance with the technical regulations of the Australian Communications and Media Authority (ACMA).
	The China RoHS mark states compliance with Directive SJ/T 11364-2014 for limiting the use of hazardous substances in electric and electronic equipment and their packaging.
	The EAC mark states compliance with the requirements of the technical regulations of the Customs Union (Eurasian Economic Union), Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia.
	The waste disposal of this product is performed in compliance with the WEEE Directive 2012/19/EU.
	The UL and cUL marks state UL approval. cUL is equivalent to CSA approval.
	The UKCA marking states compliance with the following British directives <sup>1)</sup> : <ul style="list-style-type: none"> <li>• Low Voltage Directive S. I. 2016/1101</li> <li>• EMC S. I. 2016/1091</li> <li>• The Supply of Machinery (Safety) Regulations S. I. 2008/1597</li> <li>• Directive S. I. 2012/3032 for limiting the use of certain hazardous substances in electrical and electronic equipment</li> <li>• Ecodesign Regulation S. I. 2019/539</li> </ul>
	The NM mark states compliance with the following Moroccan directives <sup>1)</sup> : <ul style="list-style-type: none"> <li>• Low Voltage Directive no. 2573-14 (16 July, 2015)</li> <li>• EMC Directive N° 2574-14 (16 July, 2015)</li> </ul>
	The KC mark declares compliance with §3 of Article 58-2 for the Korean Radio Wave Act.
	Product label with QR code. The QR code can be scanned. You will be re-directed to the digital services of SEW-EURODRIVE. There, you have access to product-specific data, documents, and additional services.

1) The selectable approvals UKCA (Great Britain) and NM (Morocco) are mutually exclusive.

## 8.2 General technical data

General technical data	
Interference immunity	Meets EN 61800-3; 2. Environment
Interference emission	Limit value category C2 to EN 61800-3
Ambient temperature $\vartheta_{amb}$	-20 °C to +60 °C
Type of cooling	Convection cooling

Environmental conditions	
Climatic conditions	<ul style="list-style-type: none"> <li>Extended storage: EN 60721-3-1 class 1K2 temperature -20 °C to +70 °C</li> <li>Transport: EN 60721-3-2 class 2K3 temperature -20 °C to +70 °C</li> <li>Operation (fixed installation, weatherproof): EN 60721-3-3 class 3K3 temperature -20 °C to +60 °C (non-condensing, no moisture condensation)</li> </ul>
Chemically active substances	<ul style="list-style-type: none"> <li>Extended storage: EN 60721-3-1 class 1C2</li> <li>Transport: EN 60721-3-2 class 2C2</li> <li>Operation (fixed installation, weatherproof): EN 60721-3-3 class 3C2</li> </ul>
Mechanically active substances	<ul style="list-style-type: none"> <li>Extended storage: EN 60721-3-3 class 1S1</li> <li>Transport: EN 60721-3-3 class 2S1</li> <li>Operation (fixed installation, weatherproof): EN 60721-3-3 class 3S1</li> </ul>
Vibration check	<ul style="list-style-type: none"> <li>3M5 in accordance with EN 60721-3-3</li> <li>5M1 in accordance with EN 60721-3-5</li> </ul>

Degree of protection	
Degree of protection	IP20 according to EN 60529
Pollution class	2 in accordance with IEC 60664-1
Overvoltage category	III in accordance with IEC 60664-1
Installation altitude	Maximum 3800 m (above sea level)

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### 8.3 Technical data of the compact controller

MOVI-C® CONTROLLER advanced UHX45A	
Electrical supply	<ul style="list-style-type: none"> <li>Power consumption: <math>P_{\max} = 12 \text{ W}</math></li> <li>Supply voltage <math>U = \text{DC } 24 \text{ V}</math> in accordance with IEC 61131-2</li> <li>Current consumption <math>I_{\max} = 500 \text{ mA}</math> (with DC 24 V supply voltage)</li> <li>The MOVI-C® CONTROLLER has to be supplied by an external voltage source.</li> </ul>
Memory	<ul style="list-style-type: none"> <li>Retain data: 30 kB</li> <li>Retain persistent: 2 kB</li> <li>Code/data/constants: 64 MB</li> </ul>
OMH45A SD memory card in the XM SD card slot	<ul style="list-style-type: none"> <li>PC-readable</li> <li>Contents: <ul style="list-style-type: none"> <li>– Firmware</li> <li>– IEC program</li> <li>– Application data</li> </ul> </li> <li>512 MB memory</li> </ul>
X5 DC 24 V supply voltage connection (2-pin connection)	<p>Connection type: Plug connector</p> <ul style="list-style-type: none"> <li>1 core: <math>0.25 \text{ mm}^2 - 2.5 \text{ mm}^2</math></li> <li>2 core: <math>0.5 \text{ mm}^2 - 1.5 \text{ mm}^2</math> (TWIN-AEH<sup>1)</sup>)</li> </ul>
X30 (RJ45 socket) EtherCAT®/SBus <sup>PLUS</sup> interface	Fast system bus SBus <sup>PLUS</sup> based on EtherCAT® for master connection
X40/X41 fieldbus interface (RJ45 socket)	<p>Fieldbus interfaces for slave connection:</p> <ul style="list-style-type: none"> <li>MOVI-C® CONTROLLER UHX45A-N: PROFINET IO</li> <li>MOVI-C® CONTROLLER UHX45A-E: EtherNet/IP™ or Modbus TCP</li> </ul>
X80/X81 Engineering interface (RJ45 socket)	<ul style="list-style-type: none"> <li>TCP/IP (<b>INFORMATION:</b> As of MOVISUITE® V2.30, IPv6 is deactivated by default)</li> <li>Possible connections: Engineering PC, visualization, other controller</li> <li>Engineering for all SEW-EURODRIVE components connected to the MOVI-C® CONTROLLER can be performed via the MOVI-C® CONTROLLER.</li> </ul>
X85 System bus and RS485 interface (9-pin connection)	<p>Connection type: Plug connector, 1 core:</p> $0.25 \text{ mm}^2 \text{ to } 0.75 \text{ mm}^2$

1) AEH: Conductor end sleeve



## 8.4 Technical data of the master module

MOVI-C® CONTROLLER advanced UHX45A /MDM90A	
Electrical supply	<ul style="list-style-type: none"> <li>Power consumption: <math>P_{\max} = 972 \text{ W}</math></li> <li>Supply voltage <math>U = \text{DC } 24 \text{ V}</math> in accordance with IEC 61131-2</li> <li>Current consumption <math>I_{\max} = 40.5 \text{ A}</math> (with DC 24 V supply voltage)</li> </ul>
X5_A External DC 24 V supply voltage (2-pin connection)	Connection type: Plug connector with strain relief <ul style="list-style-type: none"> <li>1 core: <math>0.5 \text{ mm}^2 - 16 \text{ mm}^2</math></li> <li>2 cores: <math>0.25 \text{ mm}^2 - 6 \text{ mm}^2</math> (TWIN-AEH<sup>1)</sup>)</li> </ul> Tightening torque: 1.7 – 1.8 Nm
X5_B Output for the DC 24 V supply voltage (2-pin connection)	Connection type: Plug connector via prefabricated connection
X5 Connection DC 24 V supply voltage	Connection type: CU bars $2 \times 5 \text{ mm}^2$ , M4 screw fitting
PE busbar PE connection	Connection type: CU bar $3 \times 14 \text{ mm}^2$ , M6 screw fitting
XF Safe DC 24 V supply voltage	Type: $5 \times 20 \text{ mm}$ glass tube, 4 A, 125 V, slow-blow

1) AEH: Conductor end sleeve

## 8.5 Technical data of the PROFINET interface

MOVI-C® CONTROLLER advanced UHX45A	
Manufacturer ID	010Ahex
Device ID	13dec
Connection technology	RJ45
Baud rate	100 MBaud, full duplex
Network protocols	ARP, ICMP
Application protocols	PROFINET IO, HTTP, SNMP
Port numbers used	80, 161, 310, PROFINET DCE/RPC Ports (dynamic via end point mapper)
Conformance class	C
Application profiles	PROFIsafe
Permitted cable types	Category 5 and higher, class D in accordance with IEC 11801
Maximum cable length (switch to switch)	100 m
GSD file name	GSDML-Vx.yz-SEW-MOVI-C-CONTROLLER-UHX45-yyyym-mdd-hhmmss
Process data words	256
Number of non-safe slots	16
Number of PROFIsafe stations	8
Shared device	is supported

## 8.6 Technical data of the EtherNet/IP™ interface

MOVI-C® CONTROLLER advanced UHX45A	
Manufacturer ID	013Bhex
Product code	18hex
Connection technology	RJ45
Baud rate	100 MBaud/10 MBaud full duplex/half duplex
Maximum process data length	248 PD
Application protocols	EtherNet/IP™, Modbus TCP, SNMP, DHCP
Port numbers used	67/68, 161, 310, 502, 2222, 44818
Permitted cable types	Category 5 and higher, class D in accordance with IEC 11801
Maximum cable length (switch to switch)	100 m
GSD file name	SEW MOVI-C CONTROLLER UHX45A.eds

## 8.7 Port overview

### 8.7.1 Interface description

The Ethernet interfaces of the MOVI-C® CONTROLLER have the following functions:

- X30 – EtherCAT®/SBus<sup>PLUS</sup> interface for master connection
- X40/X41 – Fieldbus interface for slave connection
- X80/X81 – Engineering interface
- X85 – System bus interface and RS485 interface

### 8.7.2 Engineering interface

#### INFORMATION



As of MOVISUITE® V2.30, IPv6 is deactivated by default.

#### INFORMATION



Ports 21 and 23 are initially closed and can be opened via the configuration.

Port	TCP/ UDP	Function	Authorization
21	TCP	FTP	Reading from and writing to the file system
23	TCP	Telnet	Reading OEM diagnostic data
310	TCP/ UDP	Data Streaming	Reading and writing of all indexed parameters
11740 – 11743	TCP	CODESYS engineering	Read and write
1740 - 1743	UDP	CODESYS engineering	Read and write
4840		CODESYS OPC UA server	
8080	HTTP	CODESYS web server	

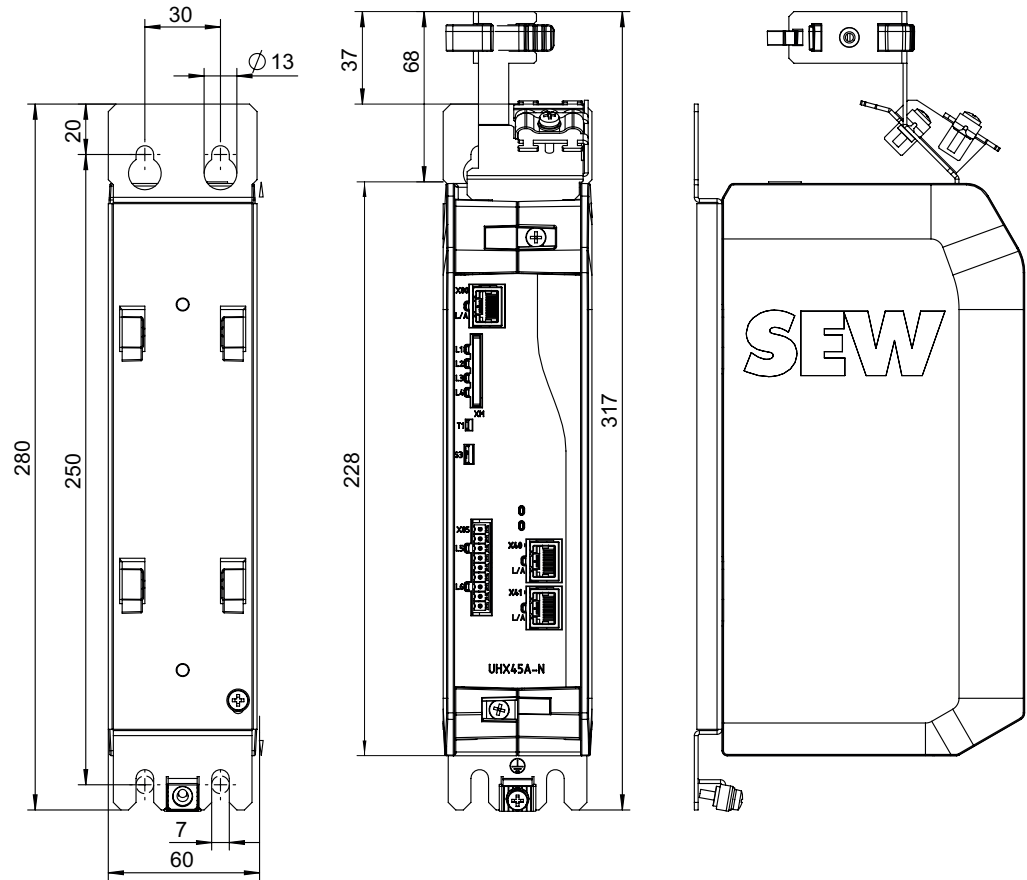
## 8.7.3 PROFINET

Port	TCP/ UDP	Function	Authorization
Dynamic port definition via End Point Mapper	UDP	PROFINET DCE/RPC	Reading and writing on all indexed parameters
Ethertype 8892hex		Process data exchange	Controlling connection
Ethertype 88B5hex		Address Editor from SEW-EURODRIVE	Reading and writing of all address parameters of the Ethernet interface
310	TCP/ UDP	Data Streaming	Reading and writing of all indexed parameters
161	UDP	SNMP	Reading on MIBs
80	TCP	Integrated web server	Read

## 8.7.4 EtherNet/IP™

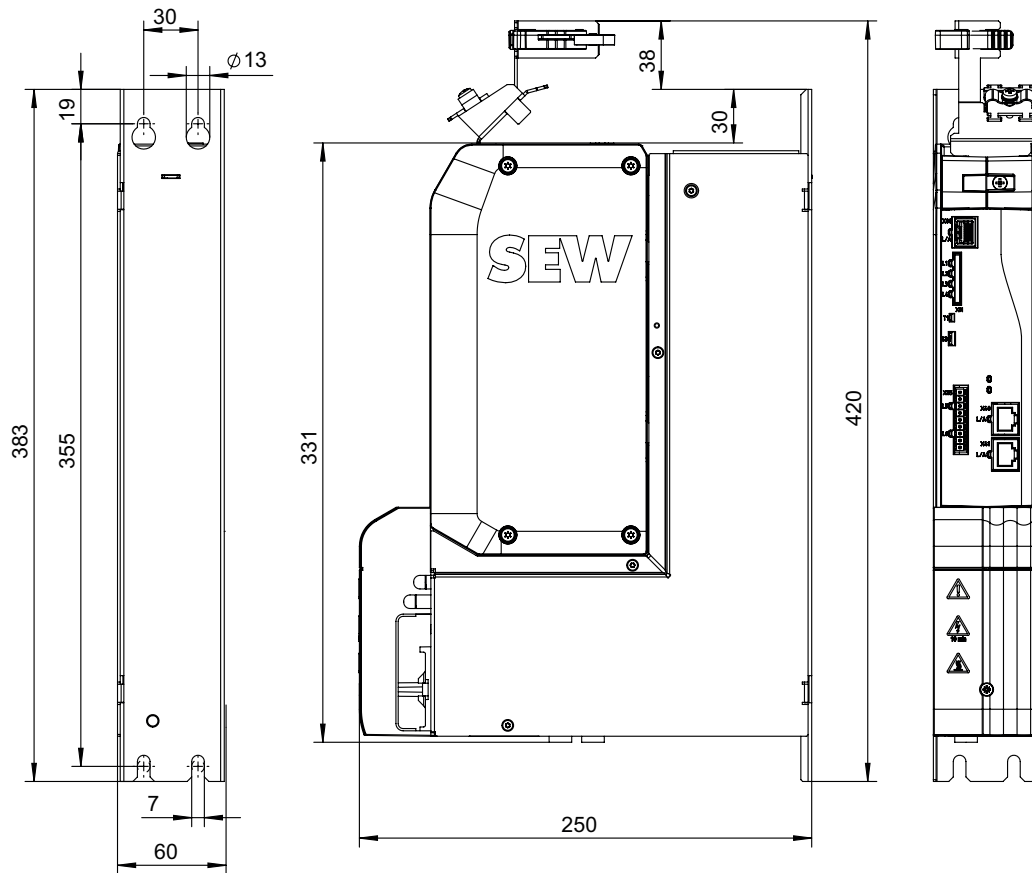
Port	TCP/ UDP	Function	Authorization
Ethertype 88B5hex		Address Editor from SEW-EURODRIVE	Reading and writing of all address parameters of the Ethernet interface
67/68	UDP	DHCP	Reading and writing of all address parameters of the Ethernet interface
161	UDP	SNMP	Reading on MIBs
310	TCP/ UDP	Data Streaming	Reading and writing of all indexed parameters
502	TCP	Modbus TCP	Process data exchange; reading and writing of all indexed parameters
2222	UDP	EtherNet/IP™	Process data exchange; reading and writing of all indexed parameters
44818	TCP/ UDP	EtherNet/IP™	Parameter exchange; reading and writing of all indexed parameters

## 8.8 Dimension drawing of the compact controller



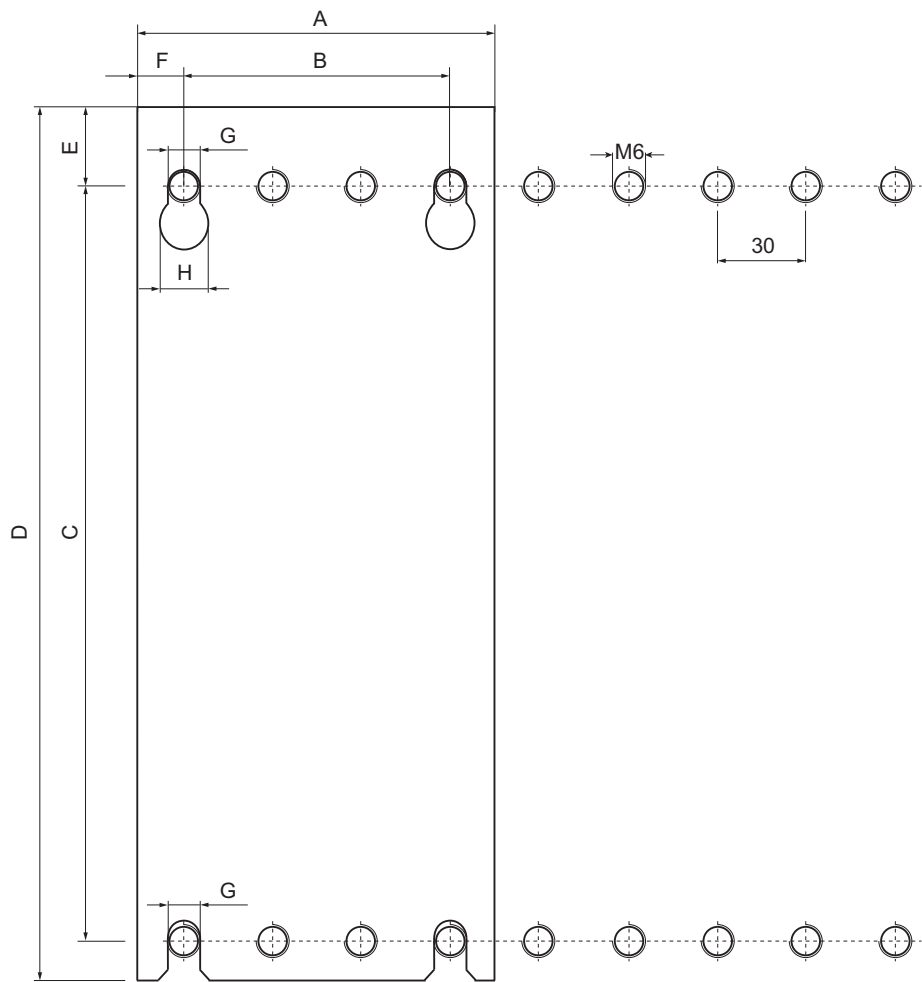
18014419552859019

## 8.9 Dimension drawing of the master module



9007219978776331

8.10 Drilling template



27021610488337547

The following table shows the dimensions in mm of the device base plate for the L-carrier MDM90A:

A	B	C	D	E	F	G	H
60	30	355	383	19	15	7	13

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## 9 Address list

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Assembly Sales Service	Toronto	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 <a href="http://www.sew-eurodrive.ca">http://www.sew-eurodrive.ca</a> <a href="mailto:l.watson@sew-eurodrive.ca">l.watson@sew-eurodrive.ca</a>
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	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2001 Ch. de l'Aviation Dorval Quebec H9P 2X6	Tel. +1 514 367-1124 Fax +1 514 367-3677 <a href="mailto:n.paradis@sew-eurodrive.ca">n.paradis@sew-eurodrive.ca</a>
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China			
Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 78, 13th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 <a href="http://www.sew-eurodrive.cn">http://www.sew-eurodrive.cn</a> <a href="mailto:info@sew-eurodrive.cn">info@sew-eurodrive.cn</a>
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<b>Croatia</b>			
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<b>Denmark</b>			
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<b>Egypt</b>			
Representation: United Arab Emirates			
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<b>France</b>			
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Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 18 89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 dc-ulm@sew-eurodrive.de
Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 dc-wuerzburg@sew-eurodrive.de

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**Greece**

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**Hungary**

Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyi út 13. 1037 Budapest	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 <a href="http://www.sew-eurodrive.hu">http://www.sew-eurodrive.hu</a> office@sew-eurodrive.hu
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**Iceland**

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**India**

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Assembly Sales Service	Chennai	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35 628700 Fax +91 21 35 628715 salespune@seweurodriveindia.com
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	Jakarta	PT. Agrindo Putra Lestari Jl.Pantai Indah Selatan, Komplek Sentra Industri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com
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Japan			
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Kazakhstan			
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	Tashkent	Representative Office SEW-EURODRIVE Representative office in Uzbekistan 95A Amir Temur ave, office 401/3 100084 Tashkent	Tel. +998 97 134 01 99 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
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<b>Latvia</b>			
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<b>Lebanon</b>			
Sales (Lebanon)	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 <a href="mailto:ssacar@inco.com.lb">ssacar@inco.com.lb</a>
Sales (Jordan, Kuwait , Beirut Saudi Arabia, Syria)		Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 <a href="http://www.medrives.com">http://www.medrives.com</a> <a href="mailto:info@medrives.com">info@medrives.com</a>
<b>Lithuania</b>			
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<b>Luxembourg</b>			
Representation: Belgium			
<b>Macedonia</b>			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 <a href="http://www.boznos.mk">http://www.boznos.mk</a>
<b>Malaysia</b>			
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<b>Mexico</b>			
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Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 <a href="http://www.sew-eurodrive.no">http://www.sew-eurodrive.no</a> <a href="mailto:sew@sew-eurodrive.no">sew@sew-eurodrive.no</a>
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<b>Russia</b>			
Assembly Sales Service	St. Petersburg	SAO «СЕВ-ЕВРОДРАЙФ» 188660, Russia, Leningrad Region, Vse- volozhsky District, Korabselki, Aleksandra Nevskogo str. building 4, block 1 P.O. Box 36 195220 St. Petersburg	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 <a href="http://www.sew-eurodrive.ru">http://www.sew-eurodrive.ru</a> <a href="mailto:sew@sew-eurodrive.ru">sew@sew-eurodrive.ru</a>
<b>Senegal</b>			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 <a href="http://www.senemeca.com">http://www.senemeca.com</a> <a href="mailto:senemeca@senemeca.sn">senemeca@senemeca.sn</a>
<b>Serbia</b>			
Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor 11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 <a href="mailto:office@dipar.rs">office@dipar.rs</a>
<b>Singapore</b>			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 <a href="http://www.sew-eurodrive.com.sg">http://www.sew-eurodrive.com.sg</a> <a href="mailto:sewsingapore@sew-eurodrive.com">sewsingapore@sew-eurodrive.com</a>
<b>Slovakia</b>			
Sales	Bernolákovo	SEW-Eurodrive SK s.r.o. Priemyselná ulica 6267/7 900 27 Bernolákovo	Tel. +421 2 48 212 800 <a href="http://www.sew-eurodrive.sk">http://www.sew-eurodrive.sk</a> <a href="mailto:sew@sew-eurodrive.sk">sew@sew-eurodrive.sk</a>
<b>Slovenia</b>			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 <a href="mailto:pakman@siol.net">pakman@siol.net</a>
<b>South Africa</b>			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED 32 O'Connor Place Eurodrive House Aeroton Johannesburg 2190 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 <a href="http://www.sew.co.za">http://www.sew.co.za</a> <a href="mailto:info@sew.co.za">info@sew.co.za</a>
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 <a href="mailto:bgriffiths@sew.co.za">bgriffiths@sew.co.za</a>
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 <a href="mailto:cdejager@sew.co.za">cdejager@sew.co.za</a>
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 <a href="mailto:robermeyer@sew.co.za">robermeyer@sew.co.za</a>

South Korea			
Assembly Sales Service	Ansan	SEW-EURODRIVE Korea Co., Ltd. 7, Dangjaengi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 <a href="http://www.sew-eurodrive.kr">http://www.sew-eurodrive.kr</a> <a href="mailto:master.korea@sew-eurodrive.com">master.korea@sew-eurodrive.com</a>
	Busan	SEW-EURODRIVE Korea Co., Ltd. 28, Noksansandan 262-ro 50beon-gil, Gangseo-gu, Busan, Zip 618-820	Tel. +82 51 832-0204 Fax +82 51 832-0230
Assembly Service	Siheung	SEW-EURODRIVE Korea Co., Ltd. 35, Emtibeui 26-ro 58beon-gil, Siheung-si, Gyeonggi-do	<a href="http://www.sew-eurodrive.kr">http://www.sew-eurodrive.kr</a>
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 <a href="http://www.sew-eurodrive.es">http://www.sew-eurodrive.es</a> <a href="mailto:sew.spain@sew-eurodrive.es">sew.spain@sew-eurodrive.es</a>
Sri Lanka			
Sales	Colombo	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd Simunye street Matsapha, Manzini	Tel. +268 7602 0790 Fax +268 2 518 5033 <a href="mailto:charles@cgtrading.co.sz">charles@cgtrading.co.sz</a> <a href="http://www.cgtradingswaziland.com">www.cgtradingswaziland.com</a>
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 <a href="http://www.sew-eurodrive.se">http://www.sew-eurodrive.se</a> <a href="mailto:jonkoping@sew.se">jonkoping@sew.se</a>
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 <a href="http://www.imhof-sew.ch">http://www.imhof-sew.ch</a> <a href="mailto:info@imhof-sew.ch">info@imhof-sew.ch</a>
Taiwan			
Sales	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Huw S. Road Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 <a href="mailto:sewtwn@ms63.hinet.net">sewtwn@ms63.hinet.net</a> <a href="http://www.tingshou.com.tw">http://www.tingshou.com.tw</a>
	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 <a href="mailto:sewtwn@ms63.hinet.net">sewtwn@ms63.hinet.net</a> <a href="http://www.tingshou.com.tw">http://www.tingshou.com.tw</a>
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 <a href="http://www.sew-eurodrive.co.tz">http://www.sew-eurodrive.co.tz</a> <a href="mailto:info@sew.co.tz">info@sew.co.tz</a>
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 <a href="mailto:sewthailand@sew-eurodrive.com">sewthailand@sew-eurodrive.com</a>
Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 <a href="http://www.tms.com.tn">http://www.tms.com.tn</a> <a href="mailto:tms@tms.com.tn">tms@tms.com.tn</a>

Turkey			
Assembly Sales Service	Kocaeli-Gebze	SEW-EURODRIVE Ana Merkez Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 <a href="http://www.sew-eurodrive.com.tr">http://www.sew-eurodrive.com.tr</a> <a href="mailto:sew@sew-eurodrive.com.tr">sew@sew-eurodrive.com.tr</a>
Ukraine			
Assembly Sales Service	Dnipropetrovsk	SEW-EURODRIVE, LLC Robochya str., bld. 23-B, office 409 49008 Dnipro	Tel. +380 56 370 3211 Fax +380 56 372 2078 <a href="http://www.sew-eurodrive.ua">http://www.sew-eurodrive.ua</a> <a href="mailto:sew@sew-eurodrive.ua">sew@sew-eurodrive.ua</a>
United Arab Emirates			
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USA			
Production Assembly Sales Service	Southeast Region	SEW-EURODRIVE INC. 220 Finch Rd P.O. Box 518 Wellford SC , 29385	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Production +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 <a href="http://www.seweurodrive.com">http://www.seweurodrive.com</a> <a href="mailto:cslyman@seweurodrive.com">cslyman@seweurodrive.com</a>
Assembly Sales Service	Northeast Region	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 <a href="mailto:csbridgeport@seweurodrive.com">csbridgeport@seweurodrive.com</a>
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 <a href="mailto:cstroy@seweurodrive.com">cstroy@seweurodrive.com</a>
	Southwest Region	SEW-EURODRIVE INC. 202 W. Daniieldale Rd. DeSoto, TX 75115	Tel. +1 214 330-4824 Fax +1 214 330-4724 <a href="mailto:csdallas@seweurodrive.com">csdallas@seweurodrive.com</a>
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Vietnam			
Sales	Ho Chi Minh City	SEW-EURODRIVE PTE. LTD. RO at Hochim- inh City Floor 8, KV I, Loyal building, 151-151 Bis Vo Thi Sau street, ward 6, District 3, Ho Chi Minh City, Vietnam	Tel. +84 937 299 700 <a href="mailto:huytam.phan@sew-eurodrive.com">huytam.phan@sew-eurodrive.com</a>
	Hanoi	MICO LTD Quảng Trị - North Vietnam / All sectors except Construction Materials 8th Floor, Ocean Park Building, 01 Dao Duy Anh St, Ha Noi, Viet Nam	Tel. +84 4 39386666 Fax +84 4 3938 6888 <a href="mailto:nam_ph@micogroup.com.vn">nam_ph@micogroup.com.vn</a> <a href="http://www.micogroup.com.vn">http://www.micogroup.com.vn</a>
Zambia			
Representation: South Africa			









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