SEW EURODRIVE

Operating Instructions

MOVI-C® CONTROLLER
progressive UHX65A

Edition 08/2022

27779408/EN

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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) 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
⚠ **DANGER**	Imminent hazard	Severe or fatal injuries
⚠ **WARNING**	Possible dangerous situation	Severe or fatal injuries
⚠ **CAUTION**	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the product or its environment
INFORMATION	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.

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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.

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1.8 Copyright notice

1.9 Short designation

The following short designations are used in this documentation.

Type designation	Short designation
MOVI-C® CONTROLLER progressive UHX65A	MOVI-C® CONTROLLER

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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.

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2.3 Target group

Specialist for mechanical work

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:

- Qualifications in the field of mechanics in accordance with the national regulations
- Familiarity with this documentation

Specialist for electrotechnical work

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:

- Qualifications in the field of electrical engineering in accordance with the national regulations
- Familiarity with this documentation

Additional qualifications

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.

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.

Instructed persons

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.

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.

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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" (→ 🗎 75) 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.

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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	• Ground connection

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" (→ 🗎 43) and "Operation" (→ 🗎 50) 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.

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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.

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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" (→ 🗎 75). 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.

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3 Device structure

3.1 Device description

The MOVI-C® CONTROLLER in the performance class "progressive" is a motion and logic 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 performance class "progressive" is suited for automating machines and cells for up to 16 interpolating axes and 16 auxiliary axes depending on the application program. It is suitable as a module controller for complex motion functions such as electronic cams and robotics, as well as for the complete automation of machines and systems.

The MOVI-C® CONTROLLER performance class "progressive" is available as version with 1-, 2- and 4-core processor. With the 4-core variant, it is optionally possible to expand the MOVI-C® CONTROLLER with a Windows operating system using the OMW CFast memory card. A hypervisor is used to run the two operating systems in parallel in such a way that the Windows operating system does not influence the real-time behavior of the IEC section. If only the real-time operating system is used, only the CFast memory card OMH is required.

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
UHX65A-0-04-N0	MOVI-C® CONTROLLER with E3845 CPU and without fieldbus interface
UHX65A-R-04-N0	MOVI-C® CONTROLLER with E3845 CPU and with the fieldbus interfaces EtherNet/IP™, Modbus TCP, and PROFINET IO
UHX65A-M-04-N0	MOVI-C® CONTROLLER with E3845 CPU and EtherNet/IP™ scanner and PROFINET IO controller as fieldbus master
UHX65A-0-02-N0	MOVI-C® CONTROLLER with E3825 CPU and without fieldbus interface
UHX65A-R-02-N0	MOVI-C® CONTROLLER with E3825 CPU and with the fieldbus interfaces EtherNet/IP™, Modbus TCP, and PROFINET IO
UHX65A-M-02-N0	MOVI-C® CONTROLLER with E3825 CPU and EtherNet/IP™ scanner and PROFINET IO controller as fieldbus master
UHX65A-0-01-N0	MOVI-C® CONTROLLER with E3815 CPU and without fieldbus interface
UHX65A-R-01-N0	MOVI-C® CONTROLLER with E3815 CPU and with the fieldbus interfaces EtherNet/IP™, Modbus TCP, and PROFINET IO
UHX65A-M-01-N0	MOVI-C® CONTROLLER with E3815 CPU and EtherNet/IP™ scanner and PROFINET IO controller as fieldbus master

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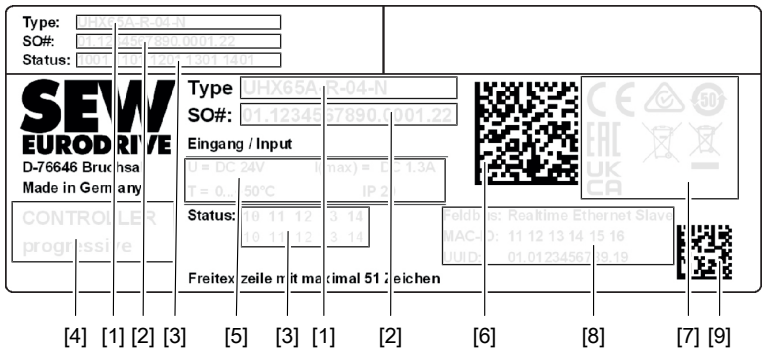
3.3 Nameplate

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



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[1] "Type code" (→ 🗎 17)
[2] Serial number
[3] Device status
[4] Device name
[5] Input data
[6] Data matrix code with type designation, serial number and device status
[7] "Markings" (→ 🗎 75)
[8] Data of the fieldbus interface
[9] Data matrix code with MAC ID of the fieldbus interface

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" (→ 🗎 75).

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3.5 Type code

The following table shows the structure of the type code:

Example: UHX65A-R-04-N0		
Product name	**UHX**	MOVI-C® CONTROLLER
Series	**65**	Progressive
Version	**A**	Version status A
Variants	**R**	• 0 = No fieldbus interface • R = With EtherNet/IP™ fieldbus interface, Modbus TCP, and PROFINET IO for slave connection • M = EtherNet/IP™ scanner and PROFINET IO controller as the fieldbus master
Performance	**04**	• 01 = E3815 CPU (1 core) • 02 = E3825 CPU (2 cores) • 04 = E3845 CPU (4 cores with TPM[1)])
Additional option	**N0**	• N0 = Retain memory available

1) Trusted Platform Module – Extension with safety functions

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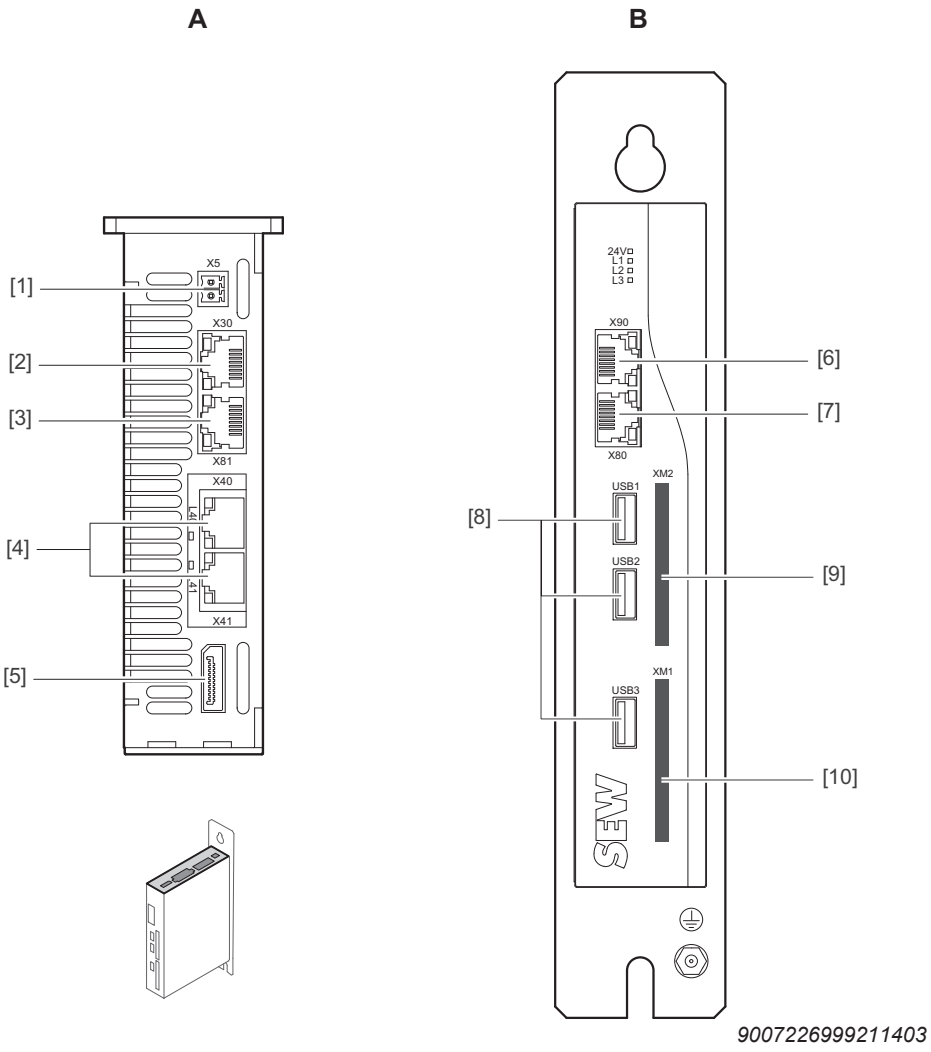
3.6 Terminals



A: View from top **B: View from front**

No.	Designation	Terminal	Function
[1]	DC 24 V supply voltage connection (-)	X5: PIN1	DC 24 V voltage supply
	DC-24 V supply voltage connection (+)	X5: PIN2	
[2]	EtherCAT®/SBus^{PLUS} interface (RJ45 socket)	X30	EtherCAT®/SBus^{PLUS} master connection
[3]	Engineering interface (RJ45 socket)	X81	Engineering interface for the control section
[4]	Fieldbus interface (RJ45 socket)	X40/X41	Real-time Ethernet fieldbus
[5]	DisplayPort interface	DP	Monitor connection
[6]	Engineering interface (RJ45 socket)	X90	Engineering interface for the Windows section

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No.	Designation	Terminal	Function
[7]	Engineering interface (RJ45 socket)	X80	Engineering interface for the control section
[8]	USB interface	USB1	USB interfaces for the Windows section
	USB interface	USB2	
	USB interface	USB3	
[9]	CFast card slot	XM2	Card slot for OMW CFast memory card (Windows section)
[10]	CFast card slot	XM1	Card slot for OMH CFast memory card (control section)

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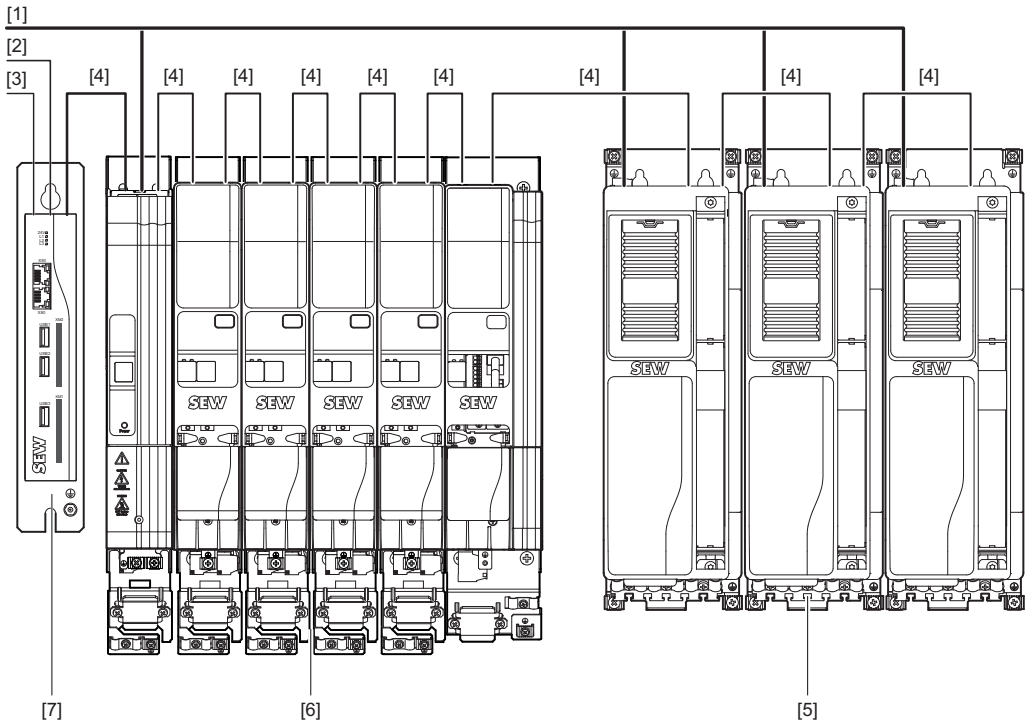
3.7 Communication interfaces

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^{PLUS} interface is used to control drive inverters, I/O modules and other EtherCAT® slave components.
- The Windows operating system provides USB interfaces for connecting a mouse, a keyboard, or a touchpad. A monitor can be connected via the DisplayPort interface.

The following figure illustrates the use of the communication interfaces:



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[1] Line voltage
[2] Fieldbus connection
[3] Engineering connection
[4] EtherCAT®/SBus^{PLUS} connection
[5] MOVIDRIVE® system
[6] MOVIDRIVE® modular axis system
[7] MOVI-C® CONTROLLER

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3.7.1 Ethernet communication interface

Ethernet communication interface X80, X81

The Ethernet communication interface X80, X81 is assigned to the control section (real-time operating system) of the MOVI-C® CONTROLLER. The following functions can be implemented via this interface:

- 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.

Ethernet communication interface X90

The Ethernet communication interface X90 is assigned to the Windows section of the MOVI-C® CONTROLLER. The interface is only available if the CFast memory card with Windows operating system is installed. The following functions can be implemented via this interface:

- Access to the Windows operating system via remote desktop connection
- Connection of a visualization system
- Connection to the master level

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3.7.2 EtherCAT®/SBus^{PLUS} interface

The following devices can be connected to the MOVI-C® CONTROLLER via the EtherCAT®/SBus^{PLUS} 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 256.

3.7.3 Fieldbus interface (X40, X41)

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

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

3.7.4 Virtual network card (VNET)

The OMW CFast memory card (Windows memory card) is required to use the virtual network card. For more information, refer to chapters "OMW CFast memory card" (→ 🗎 28) and "Virtual network card (VNET)" (→ 🗎 36).

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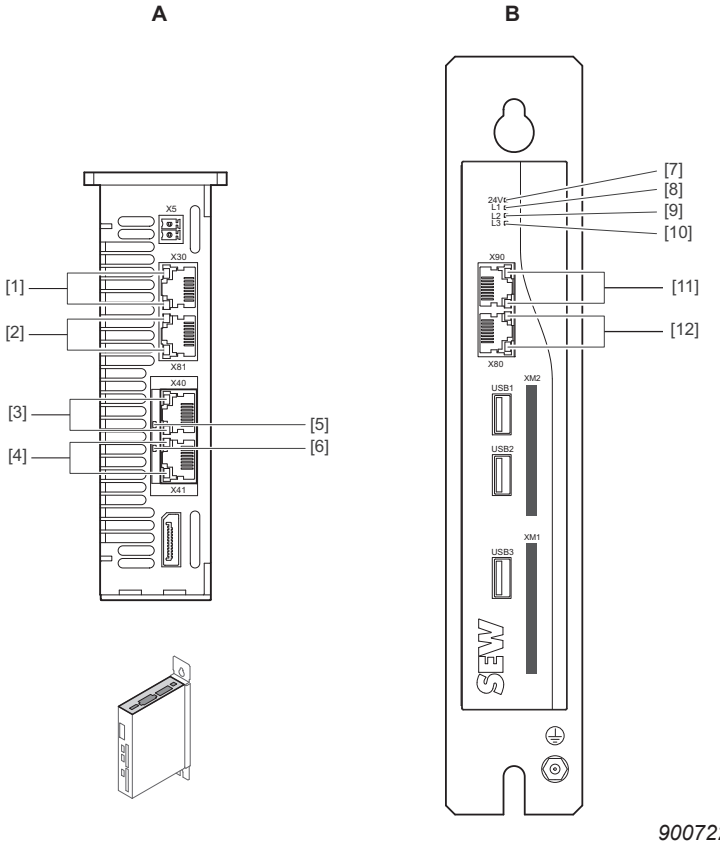
3.8 Status LEDs



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A: View from top **B: View from front**

[1] L/A: Status of the EtherCAT®/SBus^{PLUS} connection (X30)
Speed: Speed of the EtherCAT®/SBus^{PLUS} connection (X30)
[2] L/A: Status of the engineering connection (X81)
Speed: Speed of the engineering connection (X81)
[3] L/A: Status of the fieldbus connection (X40)
Speed: Speed of the fieldbus connection (X40)
[4] L/A: Status of the fieldbus connection (X41)
Speed: Speed of the fieldbus connection (X41)
[5] PROFINET – L40: SYS FAULT
EtherNet/IP^{TM}, Modbus TCP – L40: MODULE STATUS
[6] PROFINET – L41: BUS FAULT
EtherNet/IP^{TM}, Modbus TCP – L41: NETWORK STATUS
[7] 24V: 24 V voltage supply status
[8] L1: Firmware status
[9] L2: Status of the IEC program
[10] L3: Reserved
[11] L/A: Status of the engineering connection (X90)
Speed: Speed of the engineering connection (X90)
[12] L/A: Status of the engineering connection (X80)
Speed: Speed of the engineering connection (X80)

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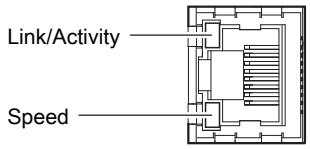
3.8.1 Status LED "Link/Activity" (L/A) and "Speed"



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Status LED "Link/Activity" (L/A)

Status	Meaning	Measure
Green	There is an Ethernet connection.	–
Green, flashing	Data is currently being exchanged via Ethernet.	–
Off	There is no Ethernet connection.	–

Status LED "Speed"

Status	Meaning	Measure
Orange	Current exchange rate of the data via Ethernet is 1000 MBit/s (1 GBit/s).	–
Off	Current exchange rate of data via Ethernet is 10 MBit/s or 100 MBit/s or there is no Ethernet connection.	–

3.8.2 Status LED "24V"

Status	Meaning	Measure
Green	The voltage supply of the device is OK.	–
Off	Device has no voltage supply.	Check the voltage supply at the respective terminal.

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3.8.3 Status LED "L1"

Indicates the status of the firmware during the boot phase and during operation.

During boot phase

Status	Meaning	Measure
Orange, flashing at 0.5 Hz	Firmware of the device starts properly.	–

During operation

Status	Meaning	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.

3.8.4 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.	–

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3.8.5 PROFINET

Status LED "L40" – PROFINET IO (SYS FAULT)

Status	Possible cause	Measure
Off	Error-free operating state	–
Red, flashes for 3 s Cyclic duration factor: 500 ms Switch-off time: 500 ms	To localize the network stations visually, the flashing test has been activated in the configuration of the PROFINET controller.	–
Red Permanently lit	Error in hardware or configuration (channel/system error)	Switch the device off and back on again. Check the configuration. If the fault occurs repeatedly, contact SEW-EURODRIVE Service.

Status-LED "L41" – PROFINET IO (BUS FAULT)

Status	Possible cause	Measure
Off	The PROFINET IO slave (device) exchanges data with a PROFINET IO master (PLC) (Data exchange).	–
Red, flashing at 2 Hz	No data exchange	–
Red	• The connection to the PROFINET IO master has failed. • PROFINET IO slave does not detect a link. • Bus interruption • The PROFINET IO master is not in operation.	• Check the fieldbus connection of the device. • Check the PROFINET IO master. • Check the cabling of the Ethernet network.

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3.8.6 EtherNet/IP™, Modbus TCP

Status LED "L40" – EtherNet/IP™ (MODULE STATUS)

Status LED	Operating status
Green	The controller is in normal operating state.
Green, flashing	The controller has not been configured yet and is in "Standby" state.
Green/red, flashing	The controller performs a LED test.
Red, flashing	Conflict detected in the assigned IP address. Another station in the network uses the same IP address.
Red	Controller fault.
Off	The controller is either not supplied with voltage, or is defective.

Status LED "L41" – EtherNet/IP™ (NETWORK STATUS)

Status LED	Operating status
Green	There is a controlling connection to the fieldbus system.
Green, flashing	No controlling connection.
Green/red, flashing	The controller performs a self-test.
Red, flashing	The previously established controlling connection has timed out. The status can be reset by restarting the communication.
Red	Conflict detected in the assigned IP addresses. Another node in the network uses the same IP address.
Off	No IP address parameter has been assigned to the controller yet.

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3.9 Accessories

3.9.1 OMH65A CFast memory card

The OMH65A CFast memory card (exact designation: OMH65A-C1) is required for operating the MOVI-C® CONTROLLER and contains the firmware, the IEC program, and user data (such as recipes). You can use the memory card for data backup and automatic parameterization in case of "Device replacement" (→ 🗎 67).

The OMH65A CFast memory card is plugged into the XM1 card slot of the MOVI-C® CONTROLLER. See chapter "Inserting memory card" (→ 🗎 33).

3.9.2 OMW CFast memory card

INFORMATION

The OMW CFast memory card may only be used in conjunction with the MOVI-C® CONTROLLER in the card slot provided for this purpose. The license terms of Microsoft apply when using the Windows operating system.

The OMW CFast memory card extends the MOVI-C® CONTROLLER by a Windows operating system and can be used, for example, for plant visualization. The OMW CFast memory card is plugged into the card slot XM2 of the MOVI-C® CONTROLLER. See chapter "Inserting memory cards" (→ 🗎 33).

The OMW CFast memory card is available in different designs. To increase the service life, we recommend using a memory card with 50% of the memory space available after installation of all applications. Intelligent memory storage management also increases the service life of the card and allows the more cost-effective MLC technology to be used.

The various features result in the following structure of the type code:

Example: OMW62A-2-C2		
Product name	**OM**	MOVI-C® CONTROLLER memory card
	W	GPOS
Design	**62**	• 62 = 32 GB • 63 = 64 GB • 64 = 128 GB • 65 = 256 GB
Version	**A**	Version status A
Technology	**2**	• 0 = SLC (Single-Level Cell) 70 °C – Service life ≈ 100000 - 300000 erase cycles – Memory card for applications with large amounts of data. • 2 = MLC (Multi-Level Cell) 85 °C – Service life: ≈ 10000 erase cycles – Alternative for applications with smaller amounts of data.
Image	**C2**	• C2 = Operating system Windows 10 IoT Enterprise (EN)

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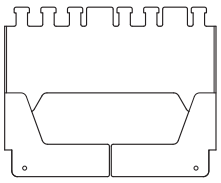
For a Windows operating system, the MOVI-C® CONTROLLER with the type designation UHX65A-R-04, for example, makes the following hardware available:

- Intel Atom E3845 (Windows 10 IoT Enterprise uses 2 kernels)
- 4 GB RAM
- 1 × Ethernet 10 MBaud/100 MBaud/1000 MBaud (X90)
- 1 × virtual Ethernet to the control section
- 3 × USB 2.0 (USB 1, 2, 3)
- 1 × DisplayPort

3.9.3 Cable routing

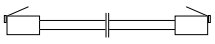
Accessories for securing and stabilizing cable routing and the connections to the MOVI-C® CONTROLLER terminals.

Designation	Part number
	
Accessories cable routing **In detail:** • 1 × cable retainer (see figure) • 2 × screw • 6 × cable tie	28260708

For information on assembly, refer to chapter "Cable routing" (→ 🗎 31).

3.9.4 System bus cable

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

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

For more information, refer to chapter "System bus cable" (→ 🗎 40).

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4 Installation

4.1 Mechanical installation

4.1.1 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.

4.1.2 Minimum clearance and mounting position

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

- Install the device with the provided carrier plate to the metal bare back of the control cabinet.
- To ensure unobstructed cooling of the MOVI-C® CONTROLLER, leave a minimum clearance of 100 mm above and below the device's housing as well as 20 mm to the right and left. Make sure air circulation in the clearance is not impaired by cables or other installation equipment. The preferred mounting position is left of the axis system.
- Ensure unobstructed cooling air supply and make sure that the MOVI-C® CONTROLLER is not exposed to the warm exhaust air from other devices.
- Only install the device vertically. Do not install the devices horizontally, tilted or upside down.

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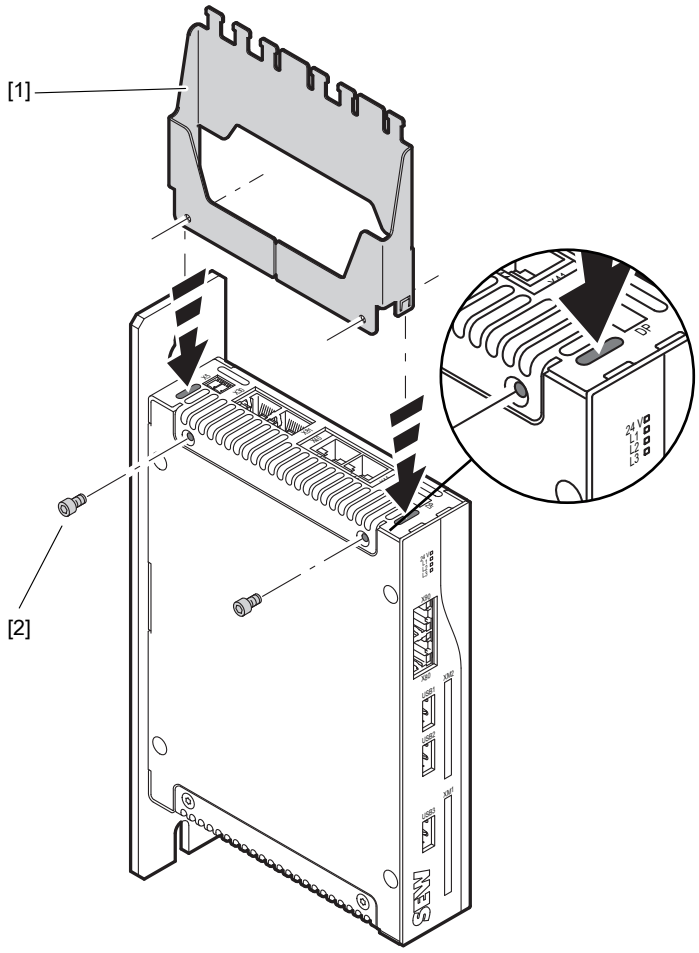
4.1.3 Accessories and options

Cable routing

Installing cable retainers

1. Loosen the screws [2] of the MOVI-C® CONTROLLER.

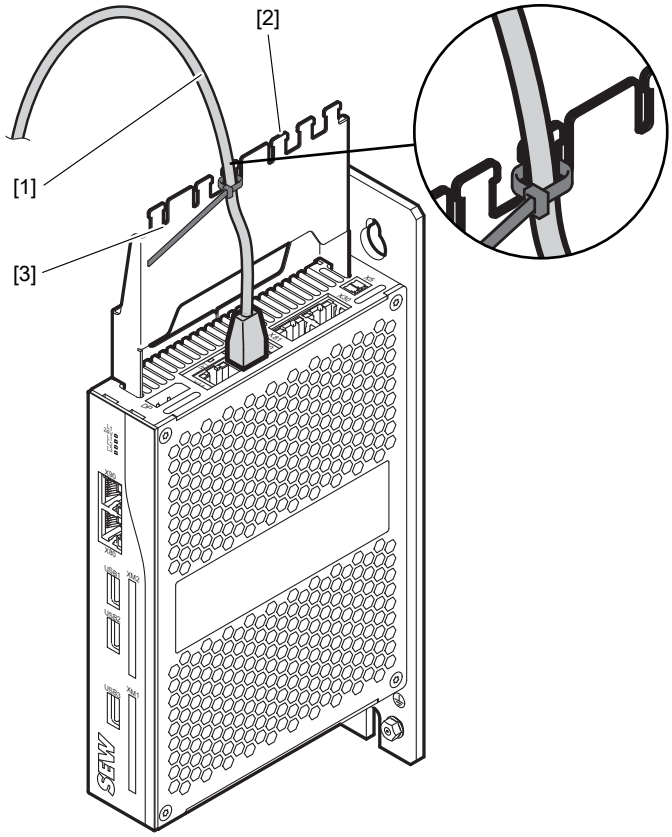


28203565963

2. Insert the cable retainer [1] to the MOVI-C® CONTROLLER as shown in the figure.
3. Insert the screws contained in the "Cable routing" (→ 🖹 29) instead of the removed screws [2] and tighten the screws.

Install cable in cable retainer

1. Route the cables [1] connected to the MOVI-C® CONTROLLER to the upper end of the cable retainer [2].



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2. Attach the cable to the cable retainer with a cable tie [3] each as shown on the figure.

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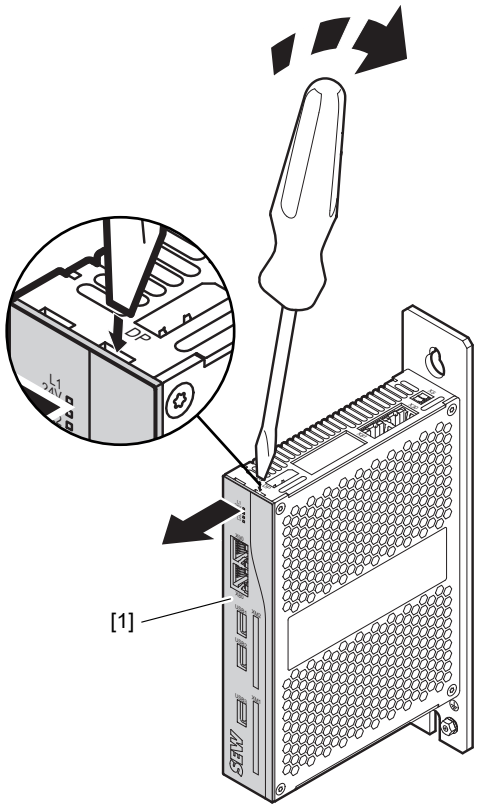
Memory cards

1. Lift the magnetically fixed front panel [1] from the MOVI-C® CONTROLLER. Use the intended recess and a screwdriver as lever.



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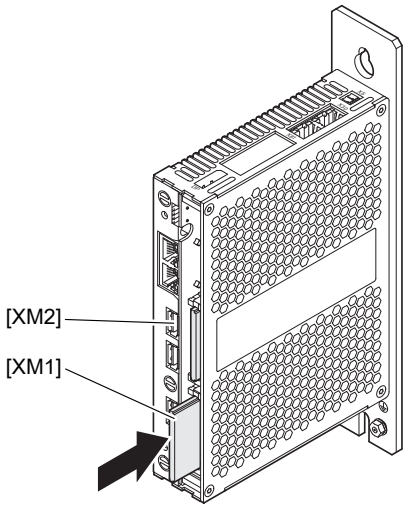
2. Plug the OMH CFast memory cards into the slot marked with XM1.
3. Plug the OMW CFast memory cards into the slot marked with XM2.



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4.2 Electrical installation

4.2.1 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**xtremely **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 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.

4.2.2 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.

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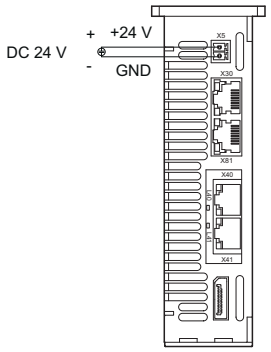
4.2.3 Voltage supply connection

An external DC 24 V power supply unit (power consumption P_{max} = 30 W) has to be used for the voltage supply of the MOVI-C® CONTROLLER.

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

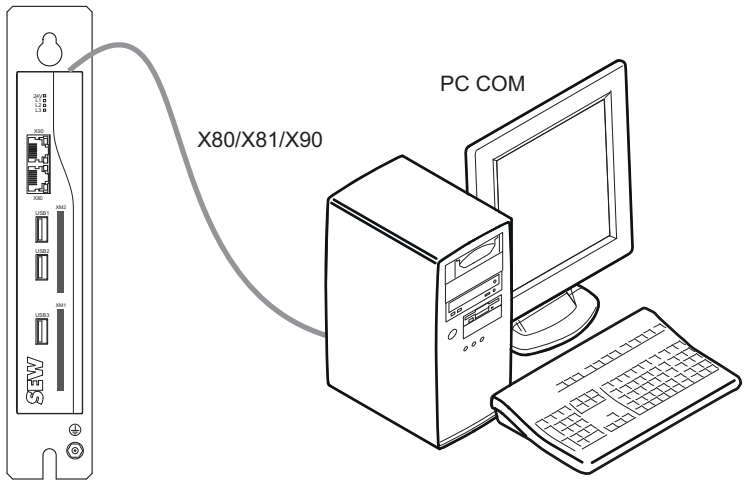
Wiring diagram



4.2.4 Engineering PC connection

To connect the MOVI-C® CONTROLLER to the Ethernet network, connect one of the Ethernet communication interfaces X80, X81 or X90 (RJ45 plug connector) to the other network stations using a category 5, class D shielded twisted-pair cable in accordance with IEC 11801 edition 2.0.

You can connect an engineering PC or other network stations (e.g. visualization systems) to the Ethernet communication interfaces. The Ethernet communication interface X90 is only available in combination with the OMW CFast memory card on a Windows operating system.



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In delivery state, the engineering interfaces of the MOVI-C® CONTROLLER have the following IP address parameters:

X80 – IP address: `192.168.10.4`, subnet mask: `255.255.255.0`

X81 – IP address: `10.1.254.128`, subnet mask: `255.255.255.0`

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4.2.5 Virtual network card (VNET)

INFORMATION

The virtual network card (VNET) does not support DHCP operation.

Apart from the hardware communication connections of the MOVI-C® CONTROLLER, the Windows operating system is also provided with a virtual network card (VNET).

VNET allows for a very simple addressing of the control section of the MOVI-C® CONTROLLER. The virtual network card behaves like a real network card and you can directly address the control section via the engineering software using the address 192.168.2.2 set as default in delivery state.

If you do not use the virtual network card (VNET), you have to interconnect the real network connections of the Windows section (X90) and of the control section (X80, X81) via a network switch.

Setting the network address of the Windows section

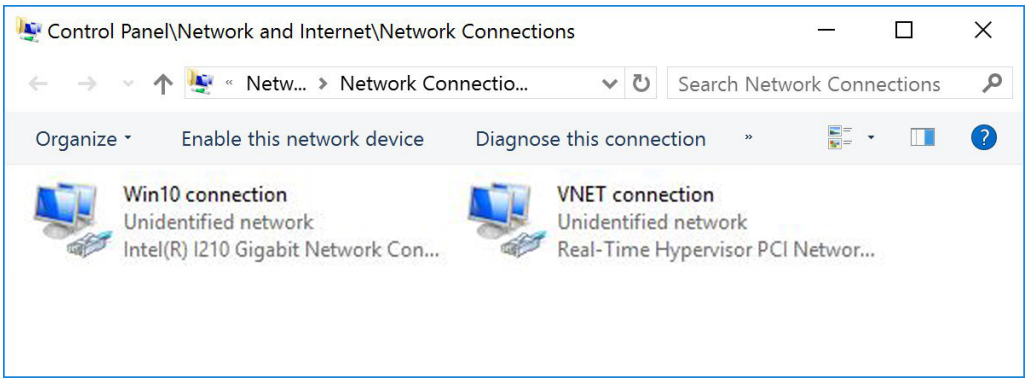
INFORMATION

Setting the network address is only required if you want to use a network address other than the default value. The network address (`192.168.2.1`) used in following instructions is initially set as default value for the Windows section.

Set the network addresses of the Windows section with the corresponding settings menus in the Windows operating system.

Proceed as follows:

1. Open the start menu and click on the "Settings" icon.
2. Click on the "Network and Internet" tile and open the "Ethernet" submenu.
3. In the "Ethernet" menu, click on the "Change adapter options" link at the right side of the screen.
   ⇨ The current network connections are displayed.



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4. Open the context menu of the "VNET connection" network connection and select "Properties".
   ⇨ The "VNET connection Properties" dialog opens.

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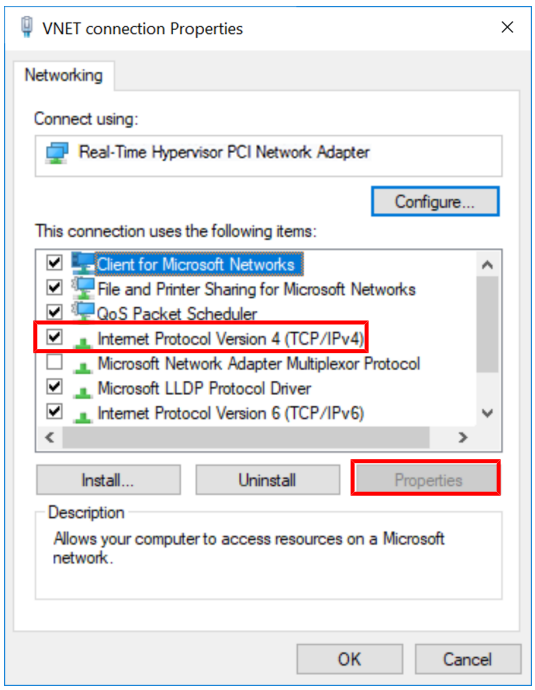
5. On the "Networking" tab, select the entry "Internet Protocol Version 4" in the group "This connection uses the following items" and then click on [Properties].



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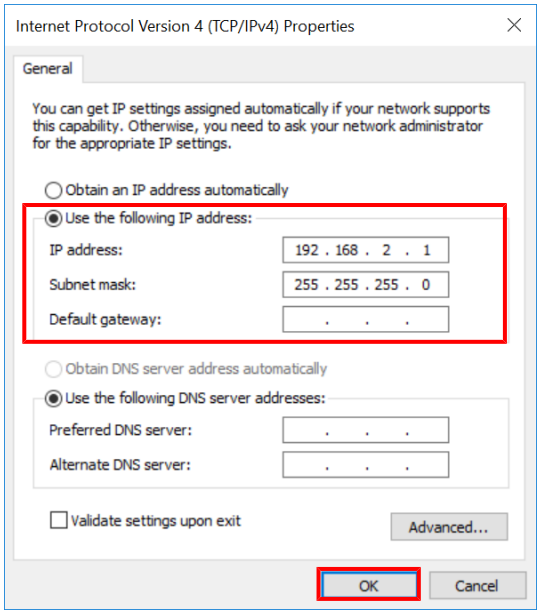
⇨ The "Internet Protocol Version 4 Properties" window is displayed.

6. Select the option "Use the following IP address" and enter the values for the IP address and the subnet mask.



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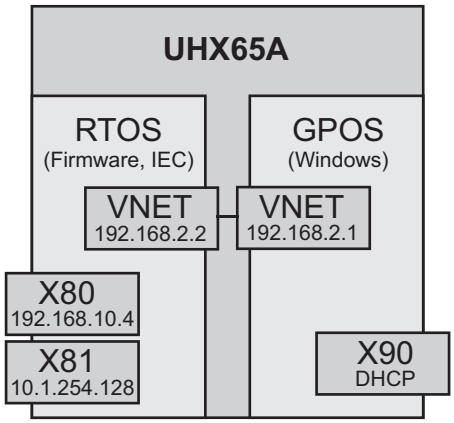
7. Confirm your entries with [OK].

Connecting Windows section and control section

Via virtual network card (VNET)

The internal connection between the Windows section and the control section is available as standard and does not require any additional hardware such as network cables, for example.



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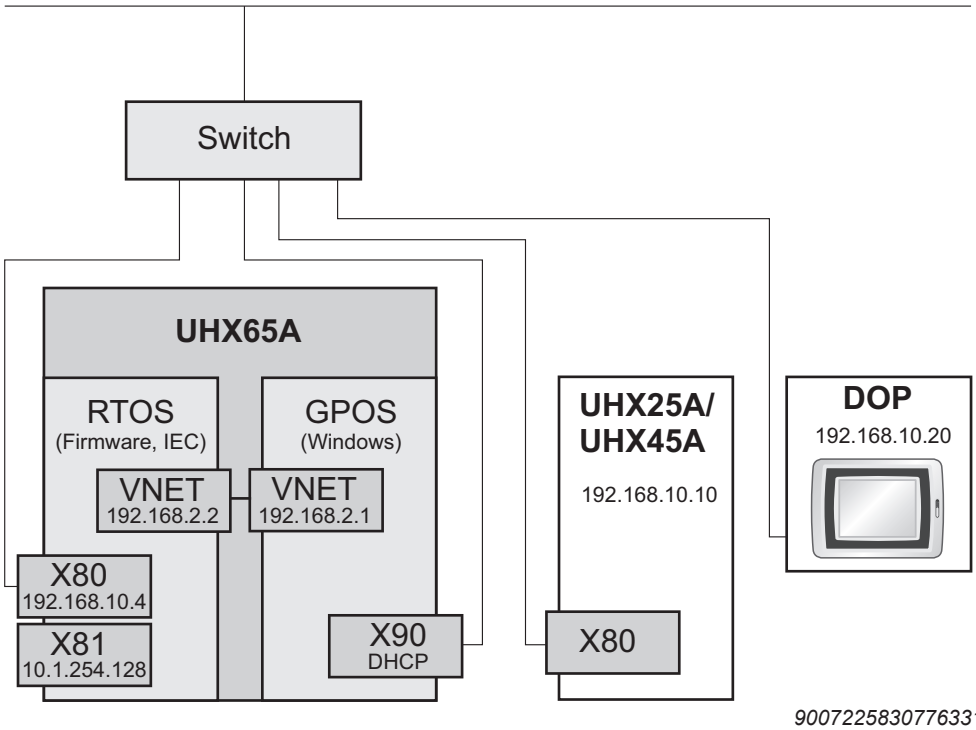
Via external network

A network switch can be used to connect an external network to the Windows section (X90), the control section (X80, X81) of the MOVI-C® CONTROLLER, and another external **UHX25A/UHX45A** MOVI-C® CONTROLLER **(terminal: X80)**. This connection option also allows you to connect external devices, e.g. a keypad.



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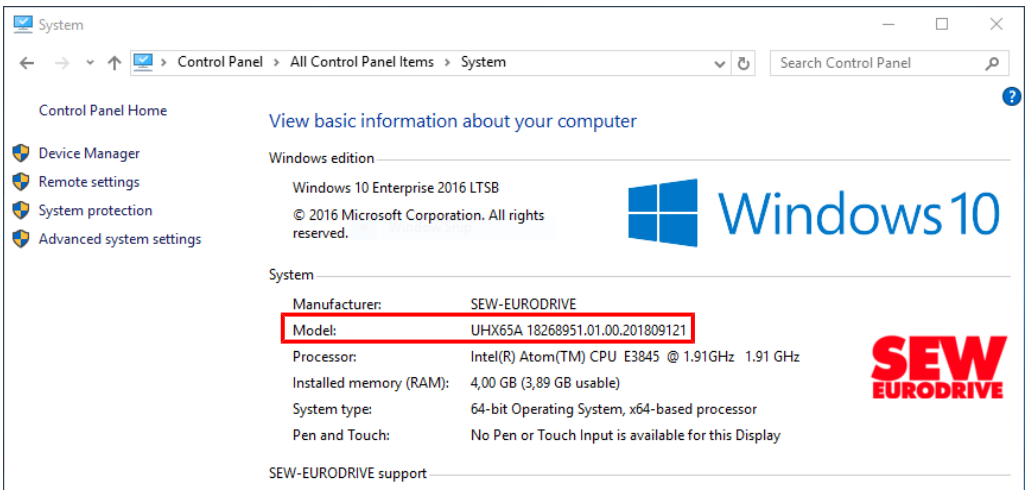
Reading out the version number of the software package

You can view the version number of the software package installed on the "OMW CFast memory card" (→ 🖹 28) via the Windows settings.

Proceed as follows:

1. Open the start menu and type "Control Panel" into the search field.
2. In the result list, click on the app entry [Control Panel].
3. Select the "System and Security" submenu and click on "System".
   ⇨ The "View basic information about your computer" window opens.



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   ⇨ The version number of the software package is displayed in the "Model" line in the "System" section.

4.2.6 EtherCAT®/SBus^{PLUS} connection

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

EtherCAT®/SBus^{PLUS} bus topology

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

INFORMATION

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

For an example of an EtherCAT®/SBus^{PLUS} bus topology, refer to chapter "Communication interfaces" (→ 🖹 20).

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" (→ 🗎 29) chapter for connecting the EtherCAT®/SBus^{PLUS} 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^{PLUS} 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^{PLUS} master.

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4.2.7 Connecting USB interfaces

The USB interfaces USB1, USB2, and USB3 are assigned to the Windows operating system (OMW CFast memory card). You can use those USB interfaces to connect a keyboard, a mouse, or a touchpad for maintenance purposes.

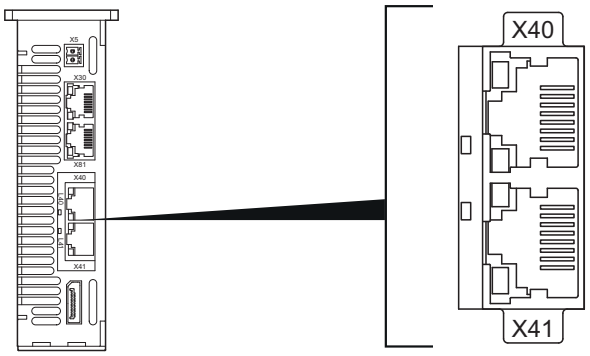
4.2.8 Fieldbus slave connection

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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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.

4.2.9 DisplayPort interface connection

The DisplayPort interface assigned to the Windows operating system (OMW CFast memory card) is used for connecting a monitor to the MOVI-C® CONTROLLER.

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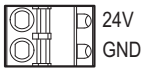
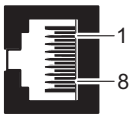
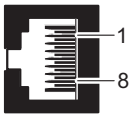
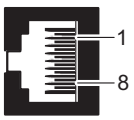
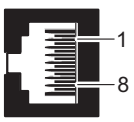
4.2.10 Terminal assignment

INFORMATION

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

Illustration	Terminal	Connection		Brief description	
	X5:24 V	V_i24 V		DC 24 V supply voltage	
	X5:GND	GND		Reference potentials inside the device (connected to PE internally)	
	X30			Fast system bus SBus^{PLUS} 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		–	
		10/100 BaseT	**1000 BaseT**	**10/100 BaseT**	**1000 BaseT**
	X90:1	TX+	DA+	Transmit line (+)	Bidirectional pair A
	X90:2	TX-	DA-	Transmit line (-)	Bidirectional pair A
	X90:3	RX+	DB+	Receive line (+)	Bidirectional pair B
	X90:4	Reserved	DC+	–	Bidirectional pair C
	X90:5	Reserved	DC-	–	Bidirectional pair C
	X90:6	RX-	DB-	Receive line (-)	Bidirectional pair B
	X90:7	Reserved	DD+	–	Bidirectional pair D
	X90:8	Reserved	DD-	–	Bidirectional pair D

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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®

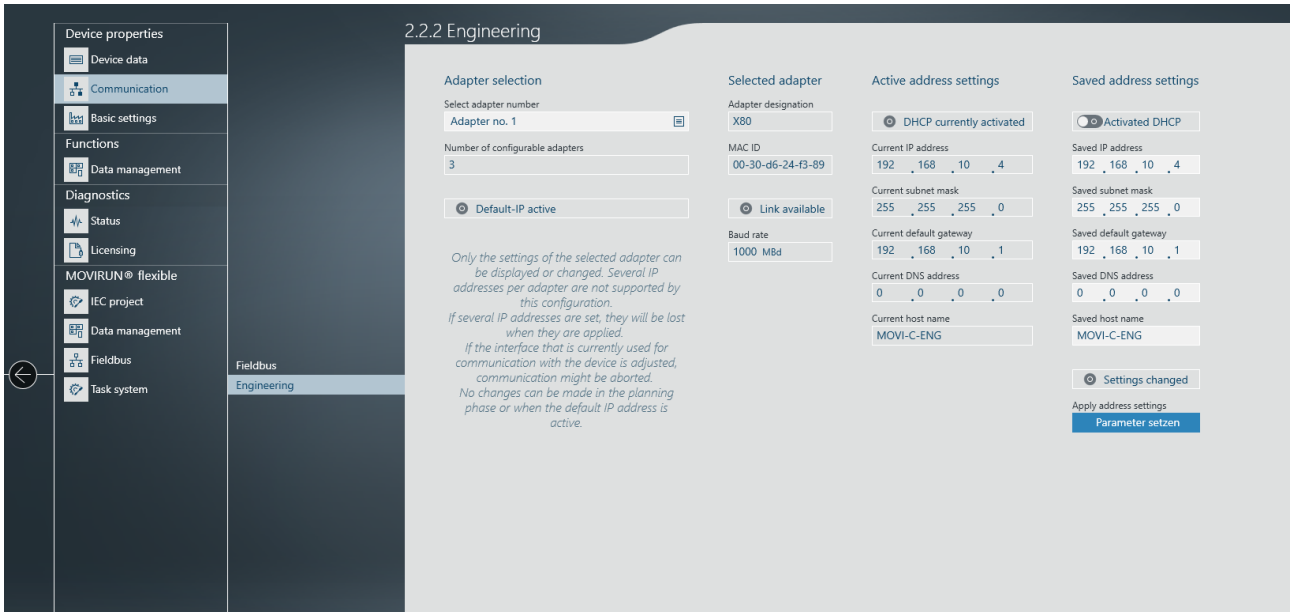
The IP address for communication can be changed directly in the configuration of the MOVI-C® CONTROLLER in MOVISUITE®. Proceed as follows:

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®" (→ 🗎 43). **INFORMATION:** When the file is deleted, the default address (`192.168.10.4`) is not set again automatically.

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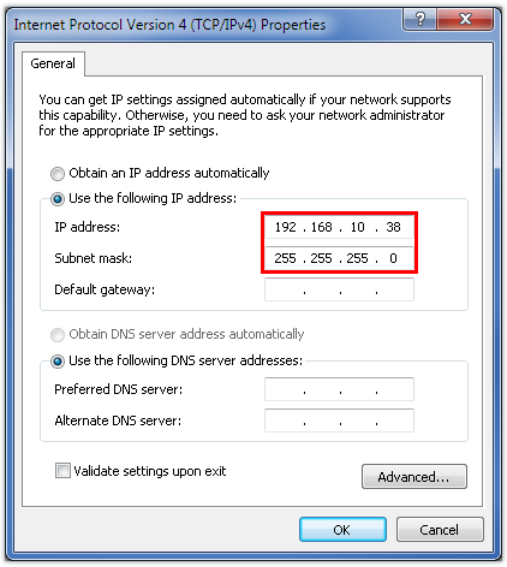
5.2 Connecting engineering PC and MOVI-C® CONTROLLER

To ensure that the engineering PC can communicate via the X80, X81 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" (→ 🗎 35).

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, X81 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.



18014415915164555

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

5.3 Inserting devices in MOVISUITE®

INFORMATION

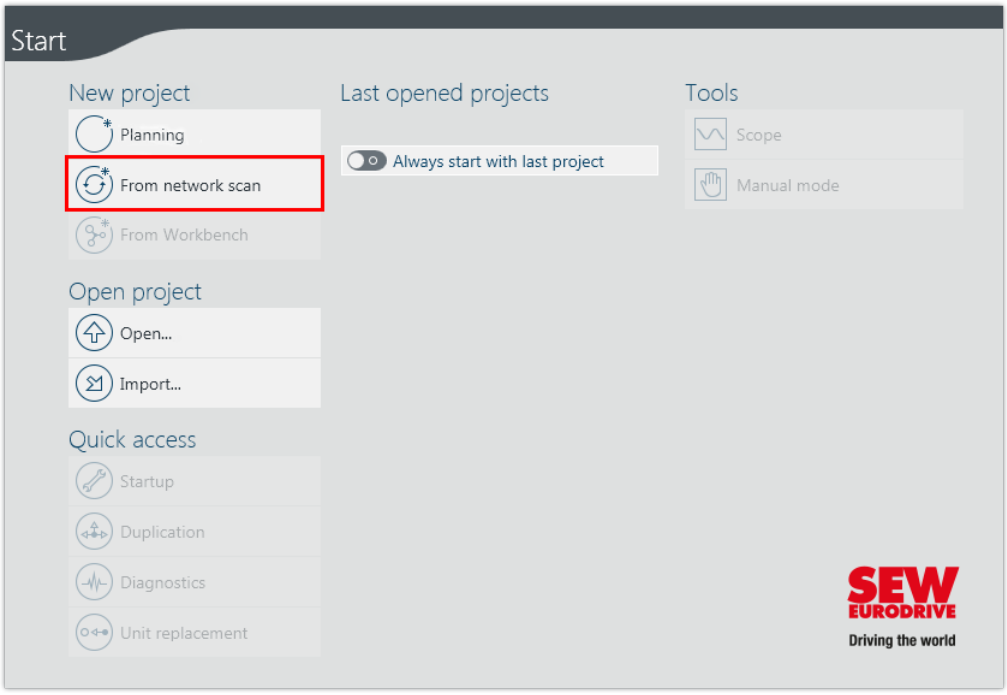
For detailed information on how to use the MOVISUITE® engineering software, refer to the corresponding documentation.

Proceed as follows:

✓ The engineering PC and the MOVI-C® CONTROLLER are connected via the (X80, X81) 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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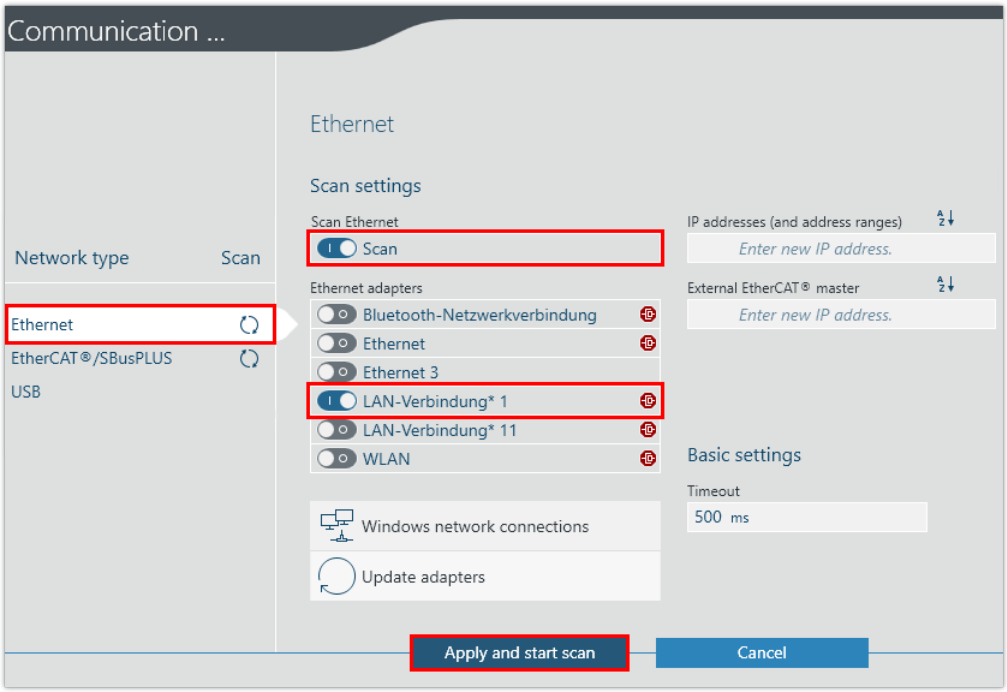
3. Select the network type (Ethernet) and activate the configured adapter (LAN connection). Apply the settings and perform the network scan.



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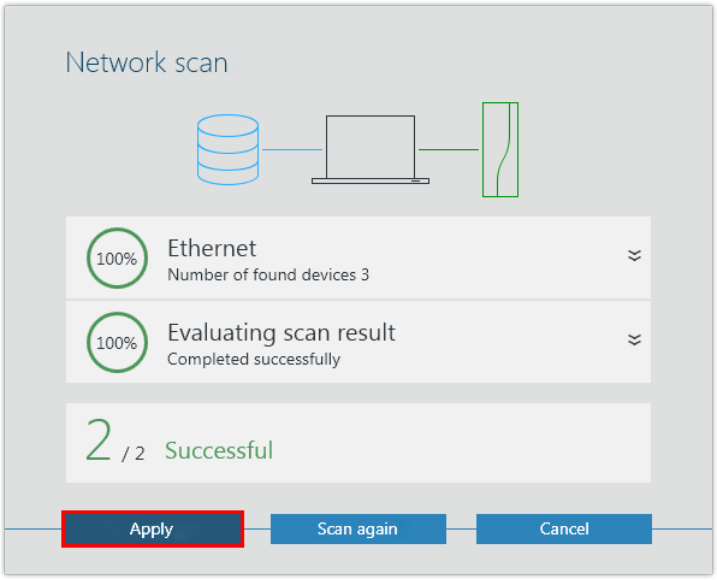
4. Apply the scanned devices to MOVISUITE®.



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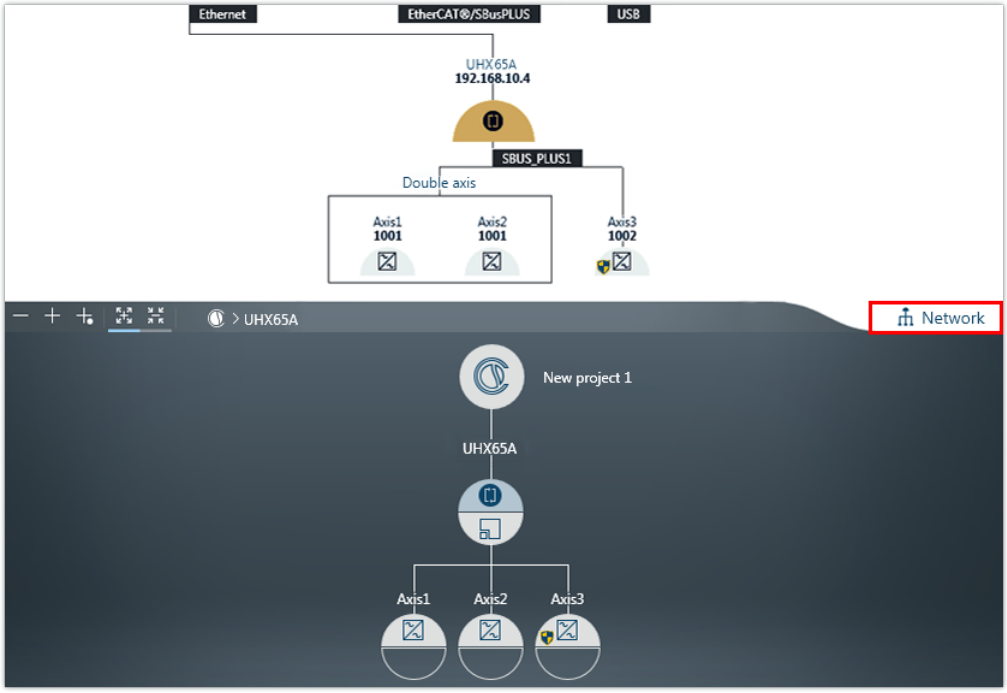
5. If necessary, load the device data into the MOVISUITE® project. Confirm the message stating that the device data has been successfully transferred.
   - ⇨ The devices are displayed in one of the MOVISUITE® views. **INFORMATION:** The display depends on the view you used when closing MOVISUITE® for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



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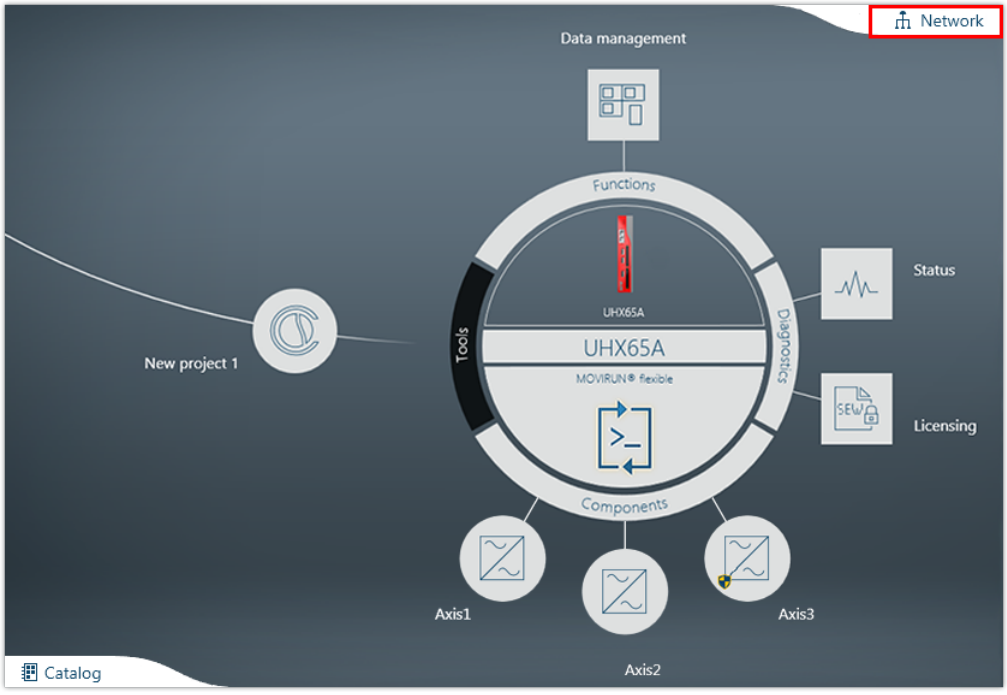
⇨ The function view has 2 views. The tree view provides an overview of the entire project. The circle view shows the current node as a large circle in the center of the workspace.



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6. To toggle between the MOVISUITE® views, click the "Network" tab.

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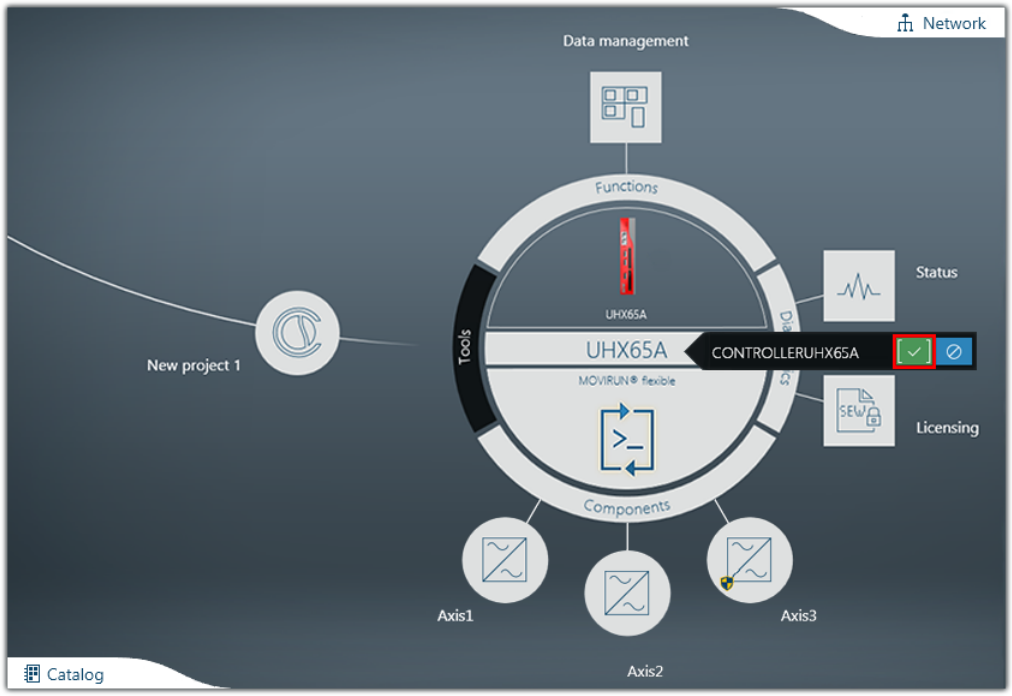
7. Enter a name for the MOVI-C® CONTROLLER. The device will then be shown in the MOVISUITE® project under this name.



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⇨ The MOVI-C® CONTROLLER has the following device name in this example: CONTROLLERUHX65A

8. Save the MOVISUITE® project.

5.4 Setting up the Windows operating system (optional)

The scope of functions of your MOVI-C® CONTROLLER can be extended to include a Windows operating system by means of the optional OMW CFast memory card.

When you start the operating system for the first time, you must first go through various setup steps. This involves adapting the operating system in terms of system time, number formats and user accounts, among other things. Furthermore, you must accept the license terms of Microsoft for using the Windows operating system.

Observe the following notes when starting the operating system for the first time:

- The installation process of the Windows operating system must be performed completely and without interruption. Interrupting the voltage supply of the MOVI-C® CONTROLLER during the boot process can damage the Windows image, which would then have to be restored by SEW-EURODRIVE Service.
- The operating system cannot be initially booted via remote desktop access. You need external input/output devices (monitor, keyboard, mouse) connected to the MOVI-C® CONTROLLER. The monitor must be connected and switched on before the MOVI-C® CONTROLLER is switched on. If the monitor is switched on afterwards, the Windows image could be damaged and would have to be restored by SEW-EURODRIVE Service.

Once the setup steps are complete, the Windows operating system is available. For further notes and instructions on using the operating system in connection with the MOVI-C® CONTROLLER, refer to chapter "Operation" (→ 🗎 51).

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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.
- 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.

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6.3 Windows operating system

6.3.1 General information

INFORMATION

- The license terms of Microsoft apply when using the Windows operating system.
- The Windows operating system on the OMW CFast memory card is only available in English.
- SEW-EURODRIVE does not offer support for setting up your Windows system.
- If you want to use a Windows remote desktop connection, you have to use a user password.

6.3.2 Monitor mode

INFORMATION

When the Windows operating system is rebooted, the graphics driver is deactivated and then reactivated. This keeps the screen black for 10 to 15 seconds during the reboot process.

During the start phase of the MOVI-C® CONTROLLER , the following resolutions are transferred to the display port interface:

- Start of the BIOS: 640 x 480 px
- Display of SEW-EURODRIVE logo: 1280 x 1024 px
- Display system start: 800 x 600 px
- Display of Windows logo: 1024 x 768 px
- Execution of Windows operating system: 1920 x 1080 px

This behavior can lead to certain monitors not displaying an image afterwards. If no image appears on the monitor, perform the following steps to correct the problem:

- Make sure that the Windows operating system has been set up completely and that the monitor was connected and switched on before the Windows operating system was switched on for the first time.

  The Windows operating system must be set up completely and without interruption until the desktop appears. Failure to follow these steps can result in sporadic image failures during the boot process or, in the worst case, total image loss. A recovery image is available as a download from the Online Support on the SEW-EURODRIVE website.

- Check the display port cable used.

  A defective or incorrectly inserted cable can be the reason for a black screen. Check whether the display port connector is correctly plugged into the monitor and the MOVI-C® CONTROLLER. Depending on the manufacturer, the display port connectors have a different length and some have a locking function. Failure to insert the display port connector in such a way that it also locks can result in image distortion or complete image loss. The length of the display port connector should be greater than 10.5 mm. Also check whether the cable works with another monitor and replace the used display port cable with a new one, if necessary.

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- If necessary, check the settings in the on-screen display menu of the monitor.

  The input of the monitor must be set to Display Port (DP). Select this option manually again (even if it is already selected) for checking. Also check whether an auto function is activated. Depending on the monitor type, the auto function can cause an incorrect input signal (DVI, HDMI, RGB) to be selected and the monitor switches to sleep mode. In addition, certain monitors offer the option of choosing between standard display ports. The display port of the MOVI-C® CONTROLLER is based on the standard 1.1 and is upward compatible. If the monitor still does not display an image in the on-screen menu after adjusting the settings mentioned above, reset the monitor to the factory settings.
- Connect the monitor using a display port adapter (DP-HDMI, DP-DVI).
- If the monitor still does not display an image, contact SEW-EURODRIVE Service. Have the following information available:
  - Is the MOVI-C® CONTROLLER operated with both CFast memory cards (RTOS and GPOS)?
  - What monitors (manufacturer, resolution) are in use?
  - Is an image displayed without CFast memory cards?
  - What is the behavior when only the Windows memory card is inserted?

6.3.3 Creating a data backup

SEW-EURODRIVE strongly recommends to create a data backup of the OMW CFast memory card, for example in the event of a "device replacement" (→ 🗎 67). Use the tools included in the Windows operating system to create a backup image.

6.3.4 Resetting the Windows section

The Windows part of the MOVI-C® CONTROLLER can be reset to the delivery state by importing a recovery image.

A corresponding recovery image is available as a download from the Online Support on the SEW-EURODRIVE website.

INFORMATION

Since the OMW CFast memory card is completely erased when applying the recovery image, license files should be backed up beforehand. Contact SEW-EURODRIVE Service in this case.

After applying the recovery image, the license file must be saved again in the same directory. If this folder structure is not displayed, hidden folder items may need to be displayed using the Windows Explorer view options.

Reading the recovery image

The following preconditions must be met so that the recovery image can be applied:

Hardware / software	Description
Recovery image package	Recovery image to be imported (e.g. `Recovery_UHX65A_18268951.01.00.201915011_ViaCFastReader_V1.0.0.0.zip`)
OMW CFast memory card	Memory medium for the recovery image

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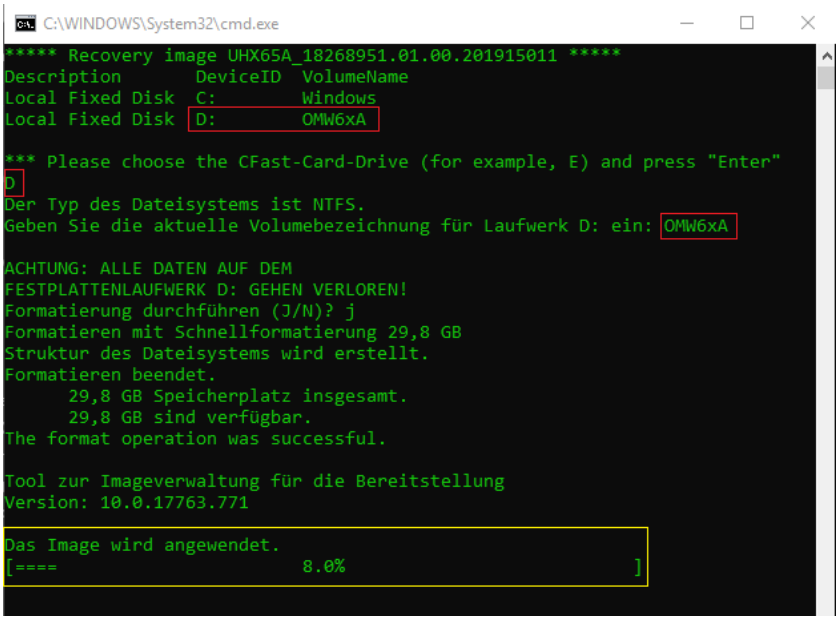
Hardware / software	Description
Card reader for the OMW CFast memory card	Transfer of the recovery image to the OMW CFast memory card
Administrator authorization on the engineering PC	Write permissions (for transfer) of the recovery image to the OMW CFast memory card
Engineering PC with Windows 10 installed	Start implementation of the recovery image on the OMW CFast memory card (only possible with Win10 Engineering System!)

Carry out the following steps to import the recovery image:

1. Insert the OMW CFast memory card into the card reader and connect the card reader to your engineering PC.
   - ⇨ The OMW CFast memory card is recognized as a new drive.
   - ⇨ Make a note of the drive letter assigned to the OMW CFast memory card for a later installation step. Incorrect entries can halt the installation or, in the worst case, delete another memory medium and subsequently install the recovery image on that memory medium.
2. Unzip the recovery image into any directory on the engineering PC.
   - ⇨ The directory with the unzipped files must contain the `Start_Recovery.bat` file. For more information, refer to the `Readme.txt` file that is also included.
3. Right-click the `Start_Recovery.bat` file to open the shortcut menu and select the [Run as administrator] menu item to start the installation of the recovery image with administrator rights.
   - ⇨ The console window for installing the recovery image opens and lists all available drives.
   - ⇨ You are prompted to enter the drive letter of the OMW CFast memory card.



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4. Enter the drive letter of the OMW CFast memory card (here: "D:") and confirm your entry by pressing [Enter].
   - ⇨ You are prompted to enter the volume name of the OMW CFast memory card.

5. Enter the volume name of the OMW CFast memory card (see list at the beginning of the installation) (here: OMW6xA) and confirm your entry by pressing [Enter].
   ⇨ A message is displayed that all data on the OMW CFast memory card will be deleted, and information about the installation is provided.
6. To confirm the installation note, enter "y" and confirm your entry with [Enter].
   ⇨ The recovery image is installed. This can take some time. The progress of the operation and the successful completion of the transfer is displayed in the command line window.

6.3.5 Switch-off and reboot behavior of the MOVI-C® CONTROLLER

INFORMATION

If the voltage supply to the MOVI-C® CONTROLLER is disconnected without first shutting down the Windows operating system, data and recently made settings can be lost. SEW-EURODRIVE therefore recommends always shutting down the Windows operating system in the normal way before disconnecting the voltage supply.

If the MOVI-C® CONTROLLER is operated with both the OMW CFast memory card and the OMH CFast memory card, then it is a combined device containing a control section and a Windows section. In this context, observe the following notes on the shutdown and reboot behavior:

- Restarting the Windows operating system

  The Windows operating system (the Windows section) is restarted. The control section keeps running as normal without a restart.
- Shutting down the Windows operating system

  The Windows operating system (the Windows section) and the control part are shut down. For restarting, the voltage supply of the MOVI-C® CONTROLLER must be disconnected and then reconnected.

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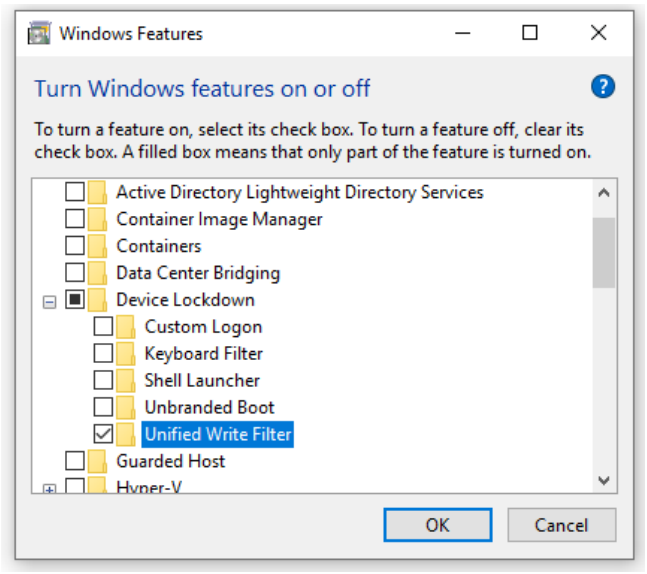
6.3.6 Setting write protection

If you switch off the DC 24 V supply voltage of the MOVI-C® CONTROLLER without shutting down the Windows operating system first, data can be lost. You can prevent such a loss of data by setting an appropriate write protection.

The write protection restricts write access to the Windows memory card. As long as write protection is enabled, there is no write access to the blocked sections of the Windows memory card. To make sure that Windows programs can keep working flawlessly, the actual write accesses are routed to the volatile RAM. In this case, newly created texts or modifications in files are lost when the system is rebooted. Windows does not output any message when there is an attempt to write on a write-protected data carrier.

Write protection is implemented using the Windows Unified Write Filter (UWF) function. The basic steps for setting up the function are described below. Further instructions, for example on how to define exceptions, can be found in the associated documentation from Microsoft.

1. Click "Start" and type "Turn Windows features on or off".
2. Click on the search result "Turn Windows features on or off" to open the system controls menu of the same name.
   ⇨ The "Windows Features" window is displayed.
3. In the "Windows Features" window, expand the "Device Lockdown" entry and activate the "Unified Write Filter" entry in it.



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4. Close the "Windows Features" window with [OK].
5. Start the command line in administrative mode.
6. Run the following command from the command line:
   ⇨ `uwfmgr filter enable`
7. To use the function, restart the computer.

8. Execute the following command to verify that the function is executed and to obtain an overview of the current configuration:

   ⇨ `uwfmgr.exe get-config`

9. Run the following command to apply write protection explicitly to the C drive:

   ⇨ `uwfmgr.exe volume protect C:`

⇨ Write protection is set up. Further instructions, for example on how to define exceptions, can be found in the associated documentation from Microsoft.

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6.3.7 Further instructions

INFORMATION

The instructions in this chapter are only intended as specific help for using the Windows operating system in connection with the MOVI-C® CONTROLLER. The explanations of the respective functions do not claim to be complete and are provided by SEW-EURODRIVE without warranty. Therefore be sure to also observe the associated documentation provided by Microsoft when using the Windows operating system.

Setting a remote desktop connection

You can use a remote desktop connection for remote maintenance purposes.

INFORMATION

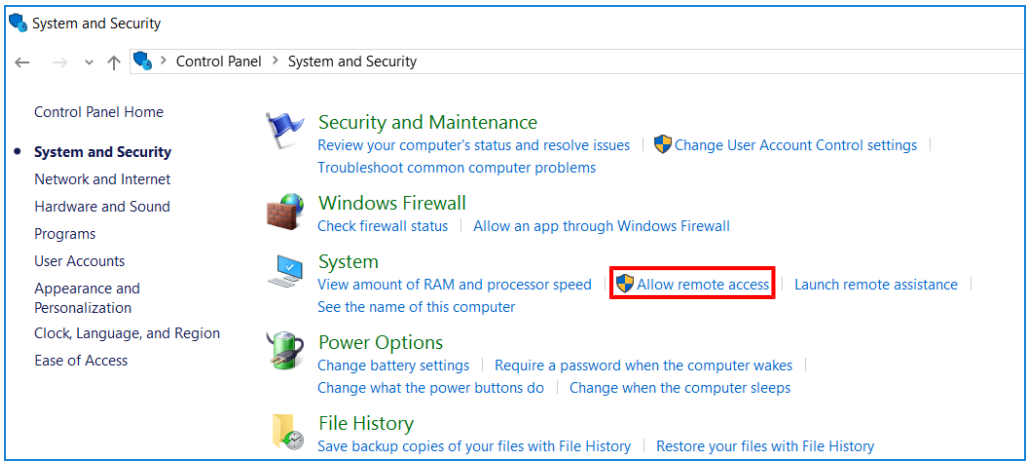
Note that remote maintenance does not allow you to monitor the state of the system on-site.

Proceed as follows:

✓ There is a network connection between your PC and the Windows section of the MOVI-C® CONTROLLER.

✓ You are working on the MOVI-C® CONTROLLER with a password-protected user account.

1. Open the start menu and type "Control Panel" into the search field.
2. In the result list, click on the app entry [Control Panel].
3. Select the "System and Security" submenu and then call up the "Allow remote access" menu in the "System" group.



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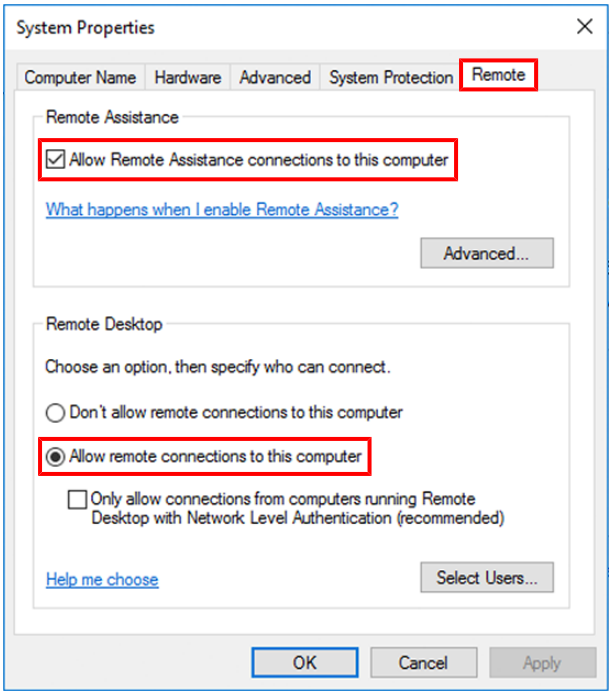
4. On the "Remote" tab, select the "Allow remote assistance connections to this computer" check box in the "Remote Assistance" section.
5. In the "Remote Desktop" section, select the "Allow remote connections to this computer" radio button and confirm your entry with [OK].



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Starting a remote desktop connection

Proceed as follows:

✓ There is a network connection between your PC and the Windows section of the MOVI-C® CONTROLLER.

✓ You are working on the MOVI-C® CONTROLLER with a password-protected user account.

✓ The remote desktop connection was set up correctly. For further information, refer to the chapter "Setting a remote desktop connection" (→ 🗎 57).

1. Open the start menu and type "Remote Desktop Connection" into the search field.
2. In the list of results, click the entry for the desktop app [Remote Desktop Connection].

   ⇨ The "Remote Desktop Connection" dialog box is displayed.
3. In the "Remote Desktop Connection" dialog box, enter the IP address of the MOVI-C® CONTROLLER in the "Computer" edit box and then click [Connect].

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Using a touchscreen monitor

On-screen keyboard

You can use the on-screen keyboard if you are working with a touchscreen monitor without keyboard and mouse.

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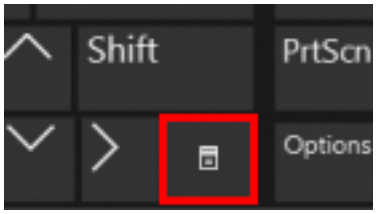
You can call up the on-screen keyboard either via the Windows Start menu (search for "On-screen keyboard") or with the icon at the bottom left of the Windows login screen.

Right mouse button

You can also simulate a right click via the on-screen keyboard. Use the following button of the on-screen keyboard.



Activating the Windows swap file

For a high workload on the MOVI-C® CONTROLLER (e.g. during startup of a visualization), it is beneficial to activate the Windows swap file. Due to the Windows swap file, there is more RAM available for applications.

Once the application is started up successfully, deactivate the Windows swap file. By deactivating the Windows swap file, you make sure that the system does not perform unnecessary write operations on the CFast OMW memory card.

INFORMATION

Switching off the MOVI-C® CONTROLLER, make sure that the system controlled by the control section is in a safe state.

Proceed as follows:

1. Open the start menu and type "Control Panel" into the search field.
2. In the result list, click on the app entry [Control Panel].
3. Select the "System and Security" submenu and click on "System".
   ⇨ The "View basic information about your computer" window opens.

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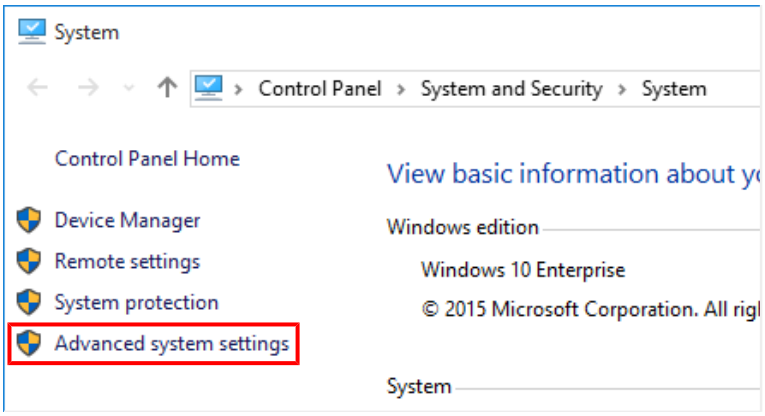
4. Select "Advanced system settings" on the left.



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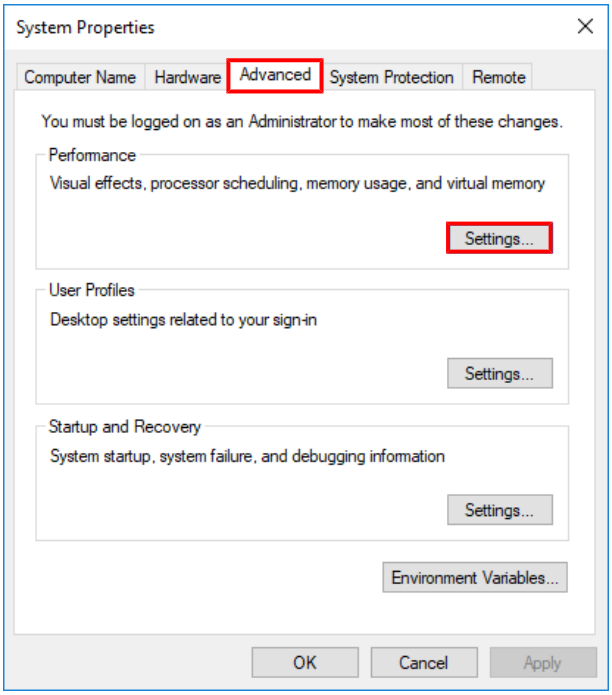
⇨ The "System Properties" window opens.

5. On the "Advanced" tab, click on the [Settings] button in the "Performance" section.



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⇨ The "Performance Options" window opens.

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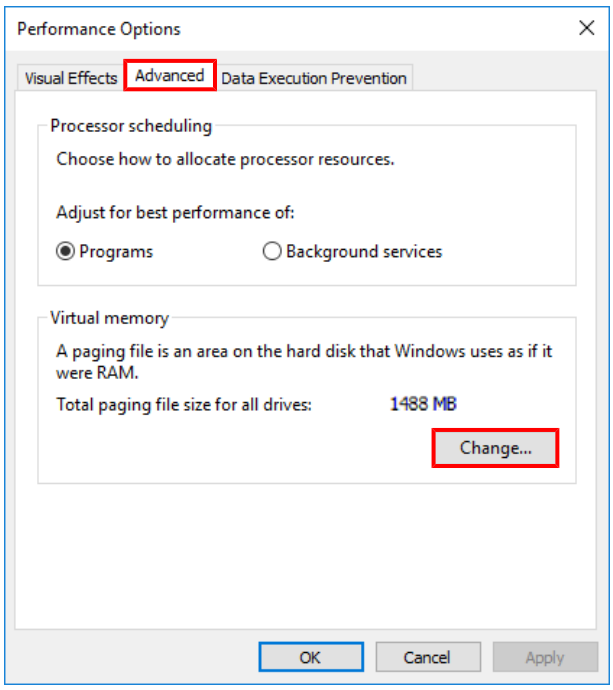
6. On the "Advanced" tab, click on the [Change...] button in the "Virtual memory" section.



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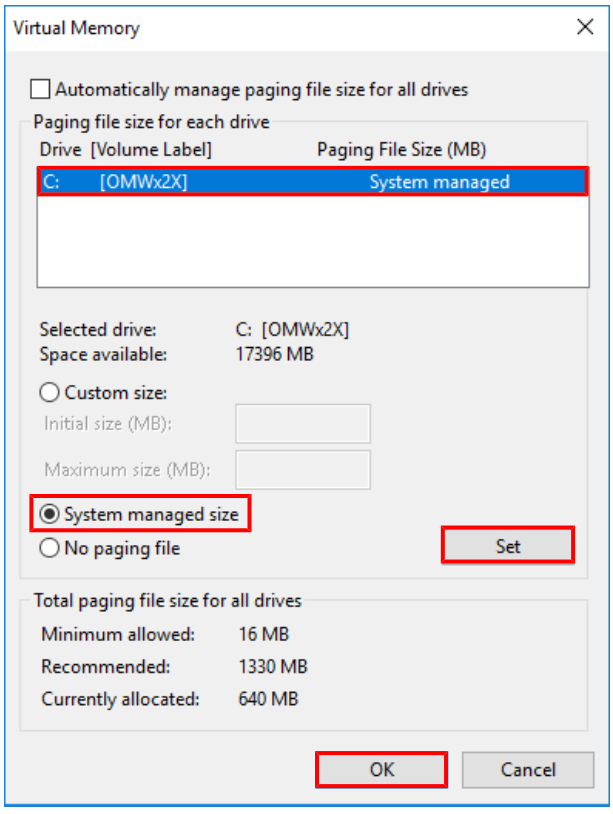
⇨ The "Virtual Memory" window opens.

7. Activate the "System managed size" radio button and then click on [Set]. Then click [OK] to confirm your entry.



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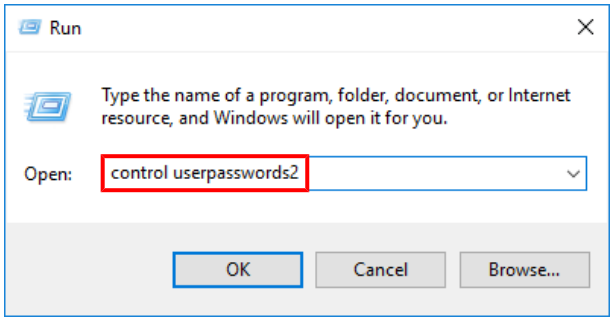
⇨ The swap file is activated.

Setting an automatic system startup

After startup, you can configure the system to boot automatically (e.g. to have directly displayed a created visualization).

Proceed as follows:

1. Open the start menu and type "Run" into the search field.
2. In the result list, click on the app entry [Run].
   ⇨ The "Run" window is displayed.
3. In the "Open" edit box, enter the command "`control userpasswords2`" and confirm with [OK].



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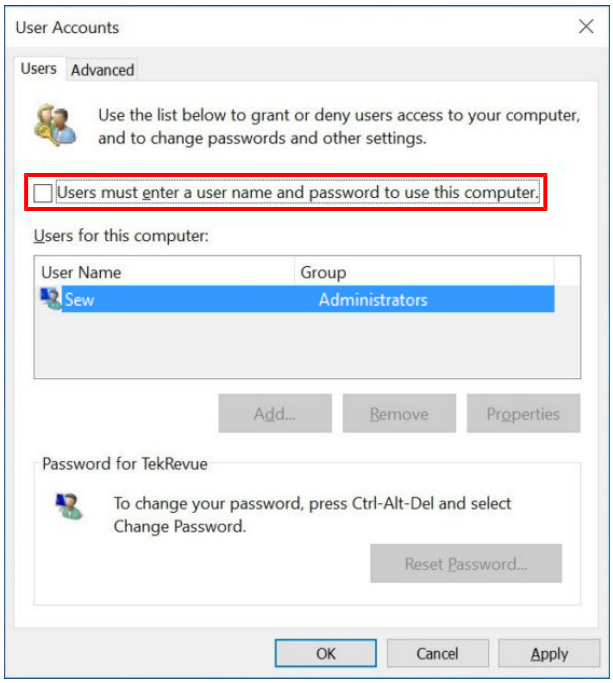
   ⇨ The "User Accounts" window opens.
4. Deactivate the "Users must enter a user name and password to use this computer" check box for the user who is planned to log in automatically.



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5. Confirm deactivation of the option with [OK].
   ⇨ You are prompted to enter your user password.
6. Enter your password and then confirm with [OK].
7. For automatic startup, create a shortcut in the "Startup" section in the Windows start menu.

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6.4 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" (→ 🗎 77).

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

6.4.1 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.

6.4.2 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.

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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].

6.4.3 Saving and restoring the RETAIN/PERSISTENT memory

During the "Device replacement" (→ 🗎 67), 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>]
```

6.5 Fault description

6.5.1 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.	– 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. – Acknowledge the fault. The MOVI-C® CONTROLLER is restarted. – If the fault occurs repeatedly, contact SEW- EURODRIVE Service.

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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.	– 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. – Acknowledge the fault. The MOVI-C® CONTROLLER is restarted. – If the fault occurs repeatedly, contact SEW- EURODRIVE Service.

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.	– 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. – Acknowledge the fault. The MOVI-C® CONTROLLER is restarted. – If the fault occurs repeatedly, contact SEW- EURODRIVE Service.

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.	– 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. If the software packages are corrupt, load original SEW-EURODRIVE software packages onto the removable storage device again. – Acknowledge the fault. The MOVI-C® CONTROLLER is restarted. – If the fault occurs repeatedly, contact SEW- EURODRIVE Service.

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6.5.2 Fault 151 controller firmware – License Manager fault

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

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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.

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" (→ 🗎 30) 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.

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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" (→ 🗎 64).

5. 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.

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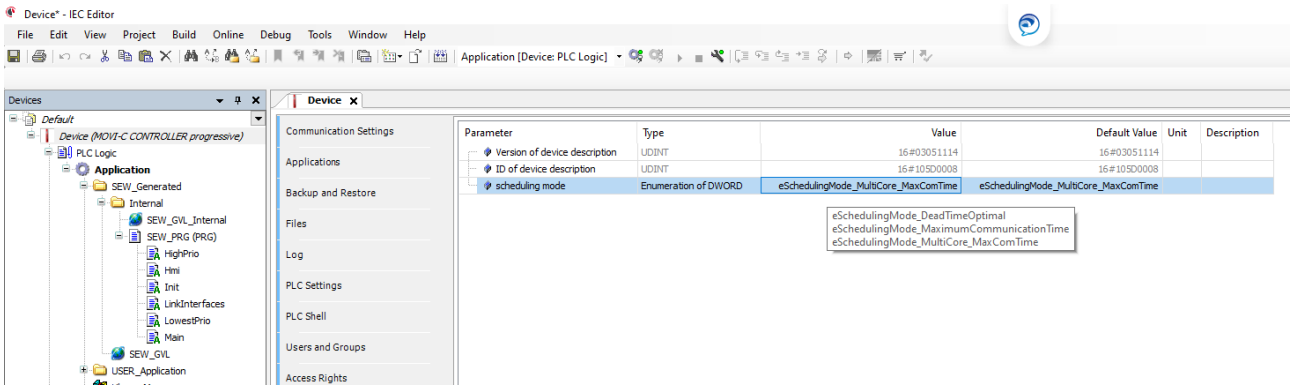
7.3 Program transfer

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:

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



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3. Set the "Scheduling mode" parameter to the value "Multicore_MaxComTime".
4. Save the IEC project.
5. Restart the MOVI-C® CONTROLLER.

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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®

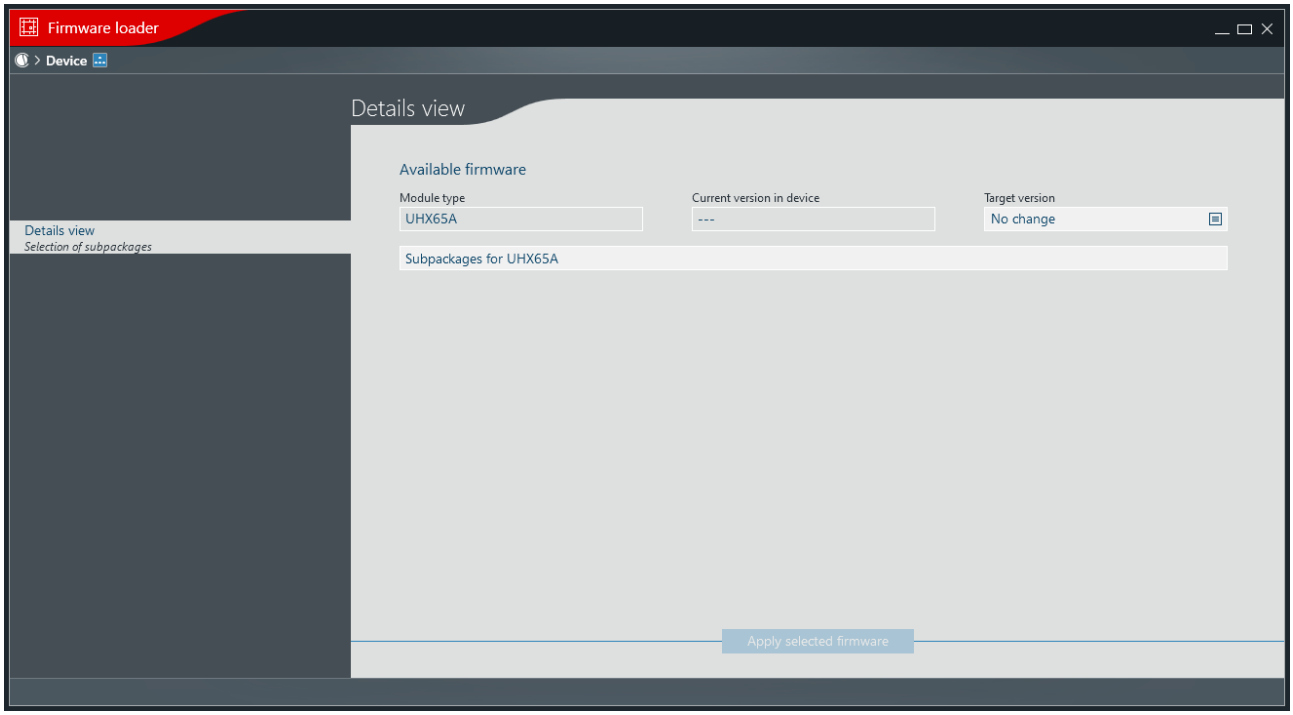
INFORMATION

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].

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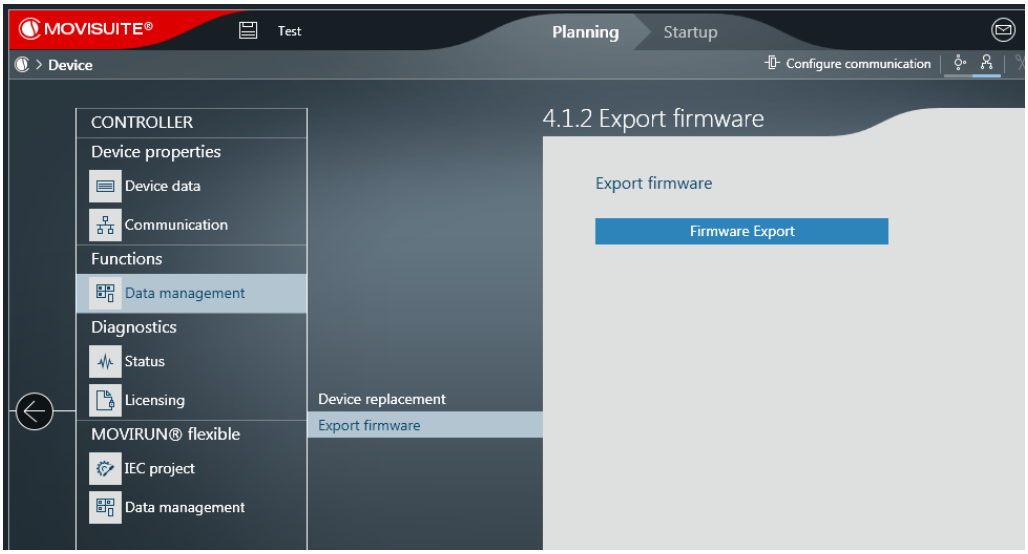
7.4.2 Via file system

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" (→ 🗎 71) 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.

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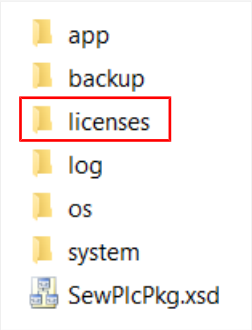
3. On your computer, use a file explorer to open the contents of the OMH memory card.
   ⇨ The "licenses" directory on the OMH memory card contains the SEW license file. To ensure that the licenses you have purchased remain valid, the SEW license file must again be contained in a "licenses" directory 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" (→ 🗎 71).
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.

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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." (→ 🗎 74)

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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.

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8 Technical data

8.1 Markings

Mark	Definition
	The CE mark states compliance with the following European directives: • Low Voltage Directive 2014/35/EU • EMC Directive 2014/30/EU • Machinery Directive 2006/42/EC • Directive 2011/65/EU for limiting the use of certain hazardous substances in electrical and electronic equipment
	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 UKCA marking states compliance with the following British directives[1]: • Low Voltage Directive S. I. 2016/1101 • EMC S. I. 2016/1091 • The Supply of Machinery (Safety) Regulations S. I. 2008/1597 • Directive S. I. 2012/3032 for limiting the use of certain hazardous substances in electrical and electronic equipment • Ecodesign Regulation S. I. 2019/539
	The NM mark states compliance with the following Moroccan directives[1]: • Low Voltage Directive no. 2573-14 (16 July, 2015) • EMC Directive N° 2574-14 (16 July, 2015)
	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 redirected 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.

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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 ϑ_{amb}	-20 °C to +50 °C
Type of cooling	Convection cooling and heat conduction

Ambient conditions	
Climatic conditions	• Extended storage: EN 60721-3-1 class 1K2 temperature -20 °C to +70 °C • Transport: EN 60721-3-2 class 2K3 temperature -20 °C to +70 °C • Operation (fixed installation, weatherproof): EN 60721-3-3 class 3K3 temperature -20 °C to +50 °C (non-condensing, no moisture condensation)
Chemically active substances	• Extended storage: EN 60721-3-1 class 1C2 • Transportation: EN 60721-3-2 class 2C2 • Operation (fixed installation, weatherproof): EN 60721-3-3 class 3C2
Mechanically active substances	• Extended storage: EN 60721-3-3 class 1S1 • Transport: EN 60721-3-3 class 2S1 • Operation (fixed installation, weatherproof): EN 60721-3-3 class 3S1
Vibration check	• 3M5 in accordance with EN 60721-3-3 • 5M1 in accordance with EN 60721-3-5

Degree of protection	
IP 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 MOVI-C® CONTROLLER

MOVI-C® CONTROLLER progressive UHX65A-R	
Electrical supply	• Power consumption: P_{max} = 30 W • Supply voltage U = DC 24 V in accordance with IEC 61131-2 • Current consumption I_{max} = 1.3 A (with DC 24 V supply voltage) • The MOVI-C® CONTROLLER has to be supplied by an external voltage source.
CPU	The following CPU variants are available: • E3815 CPU (1 core) • E3825 CPU (2 cores) • E3845 CPU (4 cores with Trusted Platform Module – Extension with safety functions)
Memory	• Retain data: 30 kB • Retain persistent: 2 kB • Code/data/constants: 96 MB
CFast memory card Windows section (card slot XM2): OMW62A (32 GB) OMW63A (64 GB) OMW64A (128 GB) OMW65A (256 GB)	• Software package: – Operating system Windows 10 IoT Enterprise (-C2)
CFast memory card control section (card slot XM1): OMH65A-C1	• PC-readable • Contents: Firmware, IEC program, application data • 2 GB memory
X5 DC 24 V supply voltage connection (2-pin connection)	Connection type: Plug connector • 1 core: 0.25 mm² to 2.5 mm² • 2 core: 0.5 mm² – 1.5 mm² (TWIN-AEH[1)])
X30 EtherCAT®/SBus^{PLUS} interface (RJ45 socket)	Fast system bus SBus^{PLUS} based on EtherCAT® for master connection
X80, X81 Engineering interface (RJ45 socket)	• TCP/IP (**INFORMATION:** As of MOVISUITE® V2.30, IPv6 is deactivated by default) • Possible connections: Engineering PC, visualization, other controller • Engineering for all SEW-EURODRIVE components connected to the MOVI-C® CONTROLLER can be performed via the MOVI-C® CONTROLLER.
X40, X41 fieldbus interface (RJ45 socket)	Fieldbus interfaces for slave connection (EtherNet/IP™, Modbus TCP and PROFINET IO)
X90	Engineering interface for the Windows section
USB 1-3	USB interfaces assigned to the Windows operating system

1) AEH: Conductor end sleeve

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8.4 Technical data of the PROFINET interface

INFORMATION

The device variant with PROFINET IO controller does not support the following functions: PROFIsafe, topology configuration, media redundancy, shared device, combi-slave, PROFINET alarm handling, topology diagnostics

MOVI-C® CONTROLLER progressive UHX65A	
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
EDS file name	GSDML-Vx.yz-SEW-MOVI-C-CONTROLLER-UHX65-yyyymmddhhmmss
Process data words	512
Number of non-safe slots	64
Number of PROFIsafe stations	24
Shared device	Not supported

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8.5 Technical data of the EtherNet/IP™ interface

MOVI-C® CONTROLLER progressive UHX65A-R	
Manufacturer ID	315 (0x013B)
Product code	20 (0x14)
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
EDS file name	SEW_UHX65A.eds

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8.6 Port overview

8.6.1 Interface description

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

- X30 – EtherCAT®/SBus^{PLUS} interface for master connection
- X80/X81 – Engineering interface for the control section
- X90 – Engineering interface for the Windows section
- X40/X41 – Fieldbus interface for slave connection

8.6.2 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	

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8.6.3 Windows interface

Depending on the installation and configuration of the Windows operating system and of additionally installed software components, the following ports are available, among others:

Port	TCP/UDP	Function
7	TCP/UDP	Echo
9	TCP/UDP	Discard
13	TCP/UDP	Daytime
17	TCP/UDP	Quote of the day
19	TCP/UDP	Character generator protocol
135	TCP	Microsoft EPMAP (End Point Mapper)/DCE/RPC Locator Service
139	TCP	Microsoft EPMAP (End Point Mapper)/DCE/RPC Locator Service
161	UDP	SNMP
300	TCP/UDP	SMLP
445	TCP	Microsoft-DS SMB release (also known as the free implementation Samba)
500	UDP	Internet Security Association and Key Management Protocol (ISAKMP)
515	TCP	Line Printer Daemon print services
3389	TCP	Microsoft Terminal Server (RDP), officially registered as Windows Based Terminal (WBT)
4500	UDP	IPSec NAT Traversal (RFC 3947)
5355	UDP	LLMNR – Link-Local Multicast Name Resolution
3389	RDP	Optional: Remote desktop sharing
11740-11743	TCP	CODESYS engineering when using MOVIKIT® Visualization
1740-1743	UDP	CODESYS engineering when using MOVIKIT® Visualization
8080	HTTP	CODESYS web server when using MOVIKIT® Visualization

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8.6.4 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

8.6.5 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

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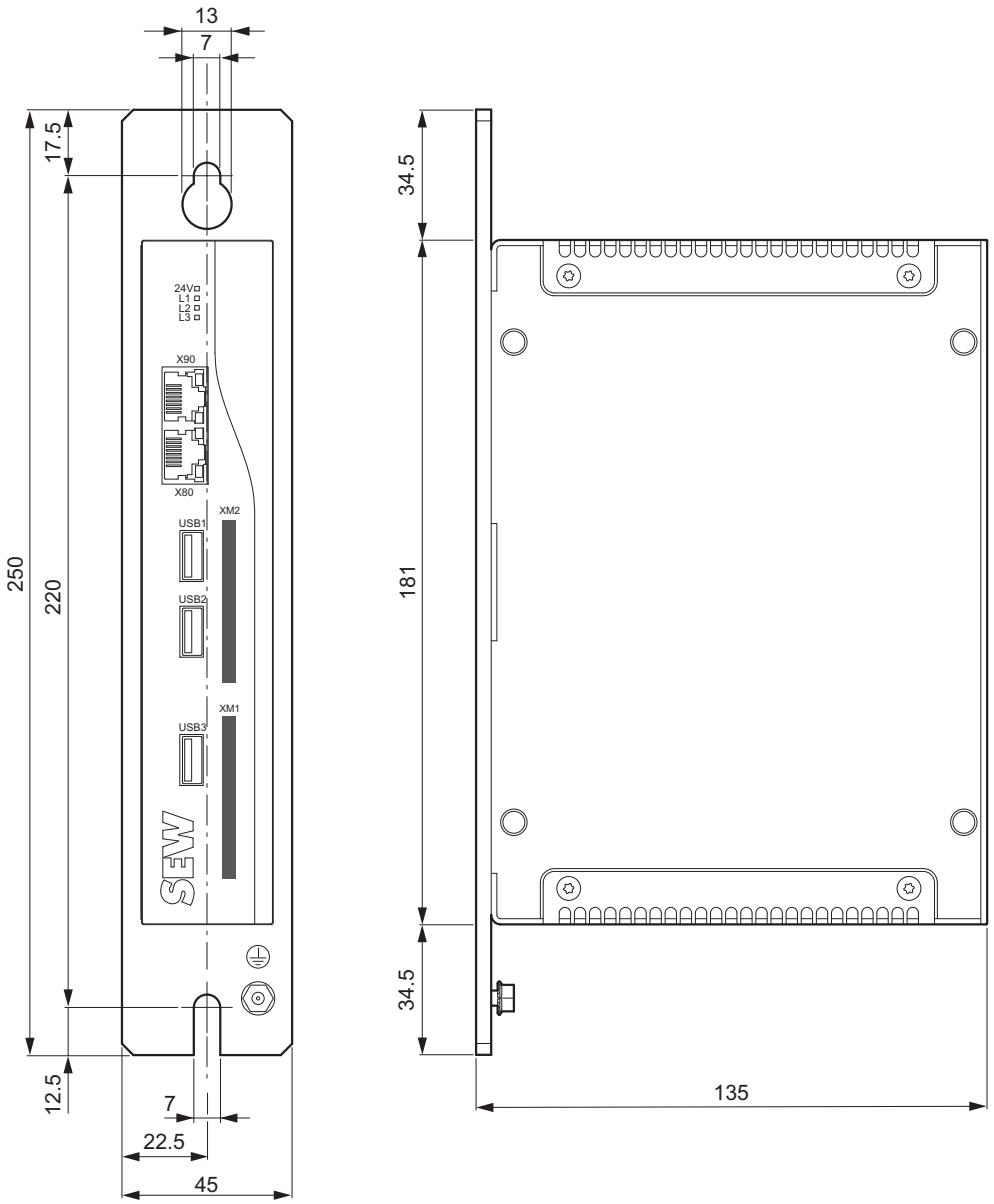
8.7 Dimension drawing of the MOVI-C® CONTROLLER



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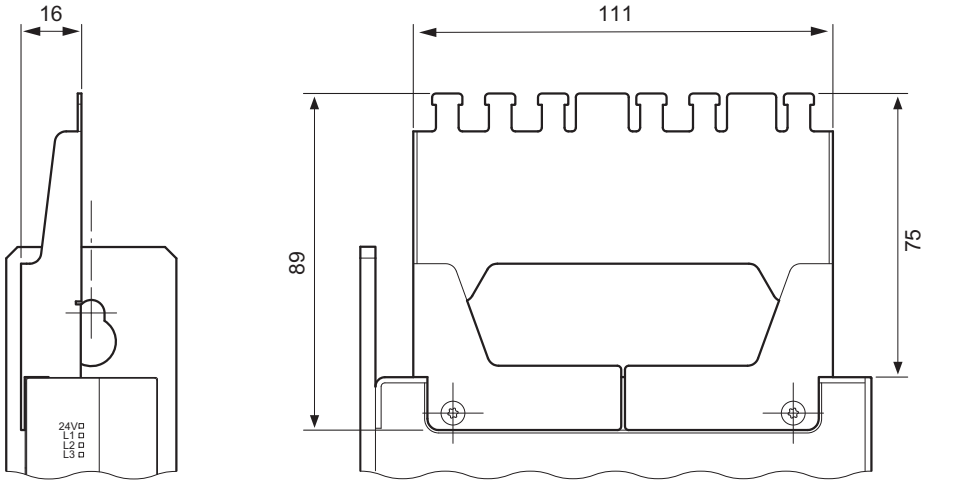
8.8 Dimension drawing of cable entry accessories



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9 Address list

Argentina			
Assembly Sales	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35 (B1619IEA) Centro Industrial Garín Prov. de Buenos Aires	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 http://www.sew-eurodrive.com.ar sewar@sew-eurodrive.com.ar
Australia			
Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
Austria			
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Bangladesh			
Sales	Bangladesh	SEW-EURODRIVE INDIA PRIVATE LIMITED 345 DIT Road East Rampura Dhaka-1219, Bangladesh	Tel. +88 01729 097309 salesdhaka@seweurodrivebangladesh.com
Belarus			
Sales	Minsk	Foreign unitary production enterprise SEW-EURODRIVE Novodvorskij village council 145 223016, Minsk region	Tel. +375 17 319 47 56 / +375 17 378 47 58 Fax +375 17 378 47 54 http://www.sew-eurodrive.by sew@sew-eurodrive.by
Belgium			
Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue du Parc Industriel, 31 6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be info@sew.be
Brazil			
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Bulgaria			
Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg

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Cameroon			
Sales	Douala	SEW-EURODRIVE SARLU Ancienne Route Bonabéri P.O. Box B.P 8674 Douala-Cameroun	Tel. +237 233 39 12 35 Fax +237 233 39 02 10 www.sew-eurodrive.ci/ info@sew-eurodrive.cm
Canada			
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 http://www.sew-eurodrive.ca l.watson@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	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 n.paradis@sew-eurodrive.ca
Chile			
Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA Las Encinas 1295 Parque Industrial Valle Grande LAMPA Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 2757 7000 Fax +56 2 2757 7001 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
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Assembly Sales Service	Suzhou	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
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	Taiyuan	SEW-EURODRIVE (Taiyuan) Co,. Ltd. No.3, HuaZhang Street, TaiYuan Economic & Technical Development Zone ShanXi, 030032	Tel. +86-351-7117520 Fax +86-351-7117522 taiyuan@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
Sales Service	Hong Kong	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

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Colombia			
Assembly Sales Service	Bogota	SEW-EURODRIVE COLOMBIA LTDA. Calle 17 No. 132-18 Interior 2 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sew@sew-eurodrive.com.co
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Sales Service	Zagreb	KOMPEKS d. o. o. Zeleni dol 10 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr
Czech Republic			
Assembly Sales Service	Hostivice	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
Denmark			
Assembly Sales Service	Copenhagen	SEW-EURODRIVEA/S Geminivej 28-30 2670 Greve	Tel. +45 43 95 8500 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Service	Vejle	SEW-EURODRIVE A/S Bødkervej 2 7100 Vejle	Tel. +45 43 9585 00 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Egypt			
Representation: United Arab Emirates			
Estonia			
Sales	Tallin	ALAS-KUUL AS Loomäe tee 1, Lehmja küla 75306 Rae vald Harjumaa	Tel. +372 6593230 Fax +372 6593231 http://www.alas-kuul.ee info@alas-kuul.ee
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	Tornio	SEW-EURODRIVE Oy Lossirannankatu 5 95420 Tornio	Tel. +358 201 589 300 Fax +358 3 780 6211 http://www.sew-eurodrive.fi sew@sew.fi
Production Assembly	Karkkila	SEW Industrial Gears Oy Santasalonkatu 6, PL 8 03620 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 http://www.sew-eurodrive.fi sew@sew.fi
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Production	Forbach	SEW USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 57604 Forbach Cedex	Tel. +33 3 87 29 38 00
	Brumath	SEW USOCOME 1 Rue de Bruxelles 67670 Mommenheim Cedex	Tel. +33 3 88 37 48 00

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	Haguenau	SEW USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 dtchaguenau@usocome.com
	Lyon	SEW USOCOME 75 rue Antoine Condorcet 38090 Vaulx-Milieu	Tel. +33 4 74 99 60 00 dtclyon@usocome.com
	Nantes	SEW USOCOME Parc d'activités de la forêt 4 rue des Fontenelles 44140 Le Bignon	Tel. +33 2 40 78 42 00 dtcnantes@usocome.com
	Paris	SEW USOCOME Zone industrielle 2 rue Denis Papin 77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 dtcparis@usocome.com
Gabon			
Representation: Cameroon			
Germany			
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Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str. 10 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Production / Precision Gear Units	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
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	Electronics	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Straße 12 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
	MAXOLUTION® Factory Automation	SEW-EURODRIVE GmbH & Co KG Eisenbahnstraße 11 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 43 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-20 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909551-21 Fax +49 89 909551-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-10 Fax +49 2173 8507-50 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Bremen	SEW-EURODRIVE GmbH & Co KG Allerkai 4 28309 Bremen	Tel. +49 421 33918-10 Fax +49 421 33918-22 tb-bremen@sew-eurodrive.de

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	Hamburg	SEW-EURODRIVE GmbH & Co KG Hasselbinnen 11 22869 Schenefeld	Tel. +49 40298109-60 Fax +49 40298109-70 dc-hamburg@sew-eurodrive.de
	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de
	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
Drive Service Hotline / 24 Hour Service			0 800 SEWHELP 0 800 7394357
Great Britain			
Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. DeVilliers Way Trident Park Normanton West Yorkshire WF6 1GX	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Greece			
Sales	Athens	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
Hungary			
Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyí út 13. 1037 Budapest	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu
Iceland			
Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 104 Reykjavík	Tel. +354 585 1070 Fax +354 585)1071 https://vov.is/ vov@vov.is
India			
Registered Office Assembly Sales Service	Vadodara	SEW-EURODRIVE India Private Limited 302, NOTUS IT PARK, Sarabhai Campus, Beside Notus Pride, Genda Circle, Vadodara 390023 Gujarat	Tel. +91 265 3045200 Fax +91 265 3045300 http://www.seweurodriveindia.com salesvadodara@seweurodriveindia.com
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
Sales Service	Gurgaon	SEW-EURODRIVE India Private Limited Drive Center Gurugram Plot no 395, Phase-IV, UdyogVihar Gurugram , 122016 Haryana	Tel. +91 99588 78855 salesgurgaon@seweurodriveindia.com

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Indonesia			
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	Jakarta	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel. +62 21 65310599 Fax +62 21 65310600 csajkt@cbn.net.id
	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
Ireland			
Sales Service	Dublin	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alperton.ie info@alperton.ie
Israel			
Sales	Tel Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il
Italy			
Assembly Sales Service	Milan	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. Via Bernini,12 20033 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 980 999 http://www.sew-eurodrive.it milano@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 27 21 21 81 05 Fax +225 27 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.ci
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
Kazakhstan			
Sales Service	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.com kazakhstan@sew-eurodrive.com
	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
	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Fax +976-77109997 imt@imt.mn

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Sales (Jordan, Kuwait , Saudi Arabia, Syria)	Beirut	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 http://www.medrives.com info@medrives.com
Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
Luxembourg			
Representation: Belgium			
Macedonia			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
Malaysia			
Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Mexico			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Sales Service	Puebla	SEW-EURODRIVE MEXICO S.A. de C.V. Calzada Zavaleta No. 3922 Piso 2 Local 6 Col. Santa Cruz Buenavista C.P. 72154 Puebla, México	Tel. +52 (222) 221 248 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Mongolia			
Technical Office	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
Morocco			
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Namibia			
Sales	Swakopmund	DB MINING & INDUSTRIAL SUPPLIES CC Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com

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New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	Greenpeg Nig. Ltd 64C Toyin Street Opebi-Allen Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpegltd.com sales@greenpegltd.com
Norway			
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 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Pakistan			
Sales	Karachi	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk
Paraguay			
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Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
Philippines			
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Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 3050-379 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

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Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 http://www.sialco.ro sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ЗАО «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 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Senegal			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 http://www.senemeca.com senemeca@senemeca.sn
Serbia			
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 office@dipar.rs
Singapore			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bernolákovo	SEW-Eurodrive SK s.r.o. Priemyselná ulica 6267/7 900 27 Bernolákovo	Tel.+421 2 48 212 800 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
South Africa			
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 http://www.sew.co.za info@sew.co.za
	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 bgriffiths@sew.co.za
	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 cdejager@sew.co.za
	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 robermeyer@sew.co.za

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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 http://www.sew-eurodrive.kr master.korea@sew-eurodrive.com
	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	http://www.sew-eurodrive.kr
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
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 charles@cgtrading.co.sz www.cgtradingswaziland.com
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 http://www.sew-eurodrive.se jonkoping@sew.se
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 http://www.imhof-sew.ch info@imhof-sew.ch
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 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
	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 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
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 http://www.sew-eurodrive.co.tz info@sew.co.tz
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 sewthailand@sew-eurodrive.com
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 http://www.tms.com.tn tms@tms.com.tn

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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 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr
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 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
United Arab Emirates			
Drive Technology Center	Dubai	SEW-EURODRIVE FZE PO Box 263835 Jebel Ali Free Zone – South, P.O. Box Dubai, United Arab Emirates	Tel. +971 (0)4 8806461 Fax +971 (0)4 8806464 info@sew-eurodrive.ae
Uruguay			
Assembly Sales	Montevideo	SEW-EURODRIVE Uruguay, S. A. Jose Serrato 3569 Esqina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-90 sewuy@sew-eurodrive.com.uy
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 http://www.seweurodrive.com cslyman@seweurodrive.com
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 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 202 W. Danieldale Rd. DeSoto, TX 75115	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Wellford	SEW-EURODRIVE INC. 148/150 Finch Rd. Wellford, S.C. 29385	Tel. +1 864 439-7537 Fax +1 864 661 1167 IGOrders@seweurodrive.com
	Additional addresses for service provided on request!		
Vietnam			
Sales	Ho Chi Minh City	SEW-EURODRIVE PTE. LTD. RO at Hochiminh 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 huytam.phan@sew-eurodrive.com
	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 nam_ph@micogroup.com.vn http://www.micogroup.com.vn
Zambia			
Representation: South Africa			

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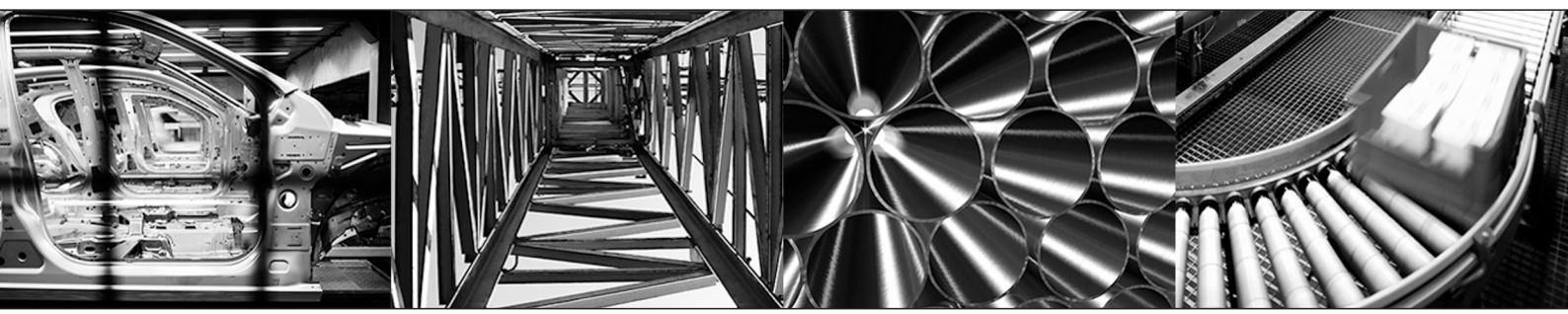

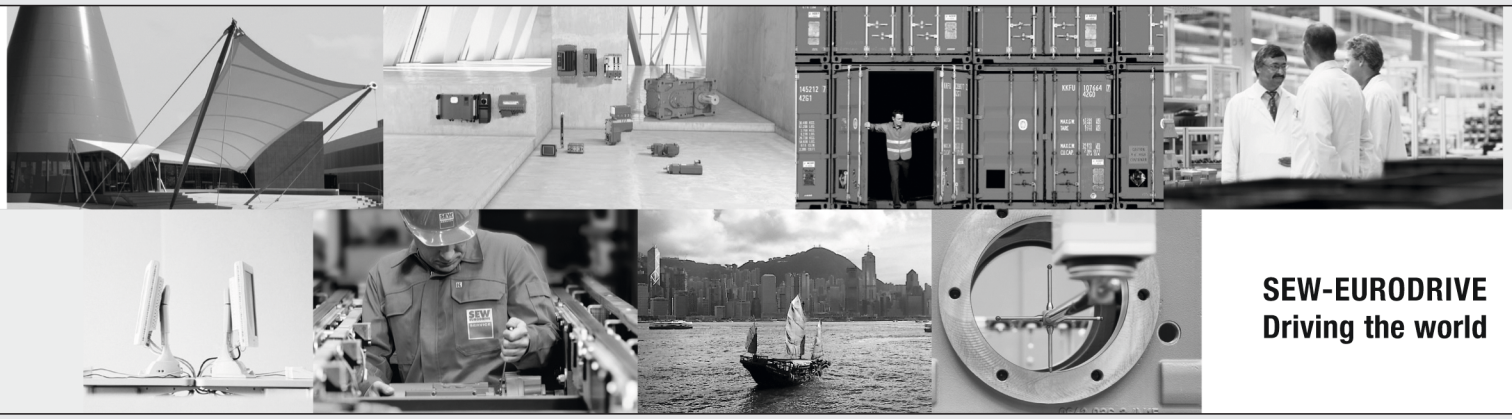

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