SEW EURODRIVE

Operating Instructions

Status: May 06, 2025

Decentralized Application Controller

FIELD CONTROLLER MOBILE

FHM35A-..

Edition 05/2025

31989055/EN

Table of Contents

31989055/EN – 05/2025

31989055/EN – 05/2025

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 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.

1.3 Structure of the safety notes

1.3.1 Meaning of signal words

The following table shows the graduation and meaning of the signal words in the safety notes.

Signal word	Meaning	Consequences if not observed
⚠ **DANGER**	Imminent danger	Death or severe injuries
⚠ **WARNING**	Possibly dangerous situation	Death or severe injuries
⚠ **CAUTION**	Possibly 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.	

1.3.2 Structure of section-related safety notes

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

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

SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

31989055/EN – 05/2025

1.3.3 Meaning of the hazard symbols

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

Hazard symbol	Meaning
	General hazard

1.3.4 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

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

1.4 Decimal separator in numerical values

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

Example: 30.5 kg

1.5 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.

1.6 Recycling, reprocessing, reuse

When manufacturing products, SEW-EURODRIVE makes sure to keep the use of new natural resources in the interests of the circular economy to a minimum. Key aspects here are the recycling of materials as well as the inspection and/or processing of returned components and their reuse in new products. These processes are only used at SEW-EURODRIVE if the resulting materials and components correspond to the quality of new products.

1.7 Product names and trademarks

The product names mentioned in this documentation are trademarks or registered trademarks of the respective titleholders.

31989055/EN – 05/2025

1.8 Copyright notice

31989055/EN – 05/2025

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:

- The national and regional regulations governing safety and the prevention of accidents
- Product safety label on the product
- All other associated project planning documents, installation and startup instructions, as well as connection and wiring diagrams
- Do not assemble, install, or operate damaged products
- All system-specific specifications and regulations

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

2.3 Target group

Specialist for mechanical work

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, and who possess the following qualifications:

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

31989055/EN – 05/2025

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, and 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 IT security

2.4.1 Contact

If you need support with the configuration, contact SEW-EURODRIVE Service. You can obtain information about current security-related issues by e-mail or on the Product Security Management website. There you will find various contact options for reporting security-related problems.

2.4.2 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.

2.4.3 IT security of the environment

For drive and control components that are integrated into a network (e.g. a fieldbus, WLAN, or Ethernet network), it is possible to make settings even more remotely. This brings with it the risk of a parameter change that is not visible externally resulting in unexpected, but not uncontrolled system behavior, and this may impact negatively on operational security, system availability, or data security.

Make sure that unauthorized access is not possible, especially for WLAN- or 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 Online Support. 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 guaranteed during operation. SEW-EURODRIVE recommends an IT security management system in accordance with ISO/IEC 27001 and ISO/IEC 62443-2-4.

31989055/EN – 05/2025

2.5 Designated use

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

When installed in electrical systems or machines, startup of the product is prohibited until it has been determined that the machine complies with local laws and guidelines.

The standards given in the declaration of conformity apply to the product.

The systems can be mobile or stationary.

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.

2.5.1 Restrictions under the European WEEE Directive 2012/19/EU

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

2.5.2 Restrictions of use

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

- Use in potentially explosive areas.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, and radiation.
- Use in applications with impermissibly high mechanical vibration and shock loads
- Use at an elevation of more than 3800 m above sea level.
- Operation in outdoor areas
- Use in locations for which radio approval is not available. For an overview of the radio approvals, see chapter "Technical data" (→ 🗎 54)

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 or the packaging is damaged, do not assemble, install, connect, or start up the product. If the packaging is damaged, the product itself may also be damaged.

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" (→ 🗎 54) of the documentation.

2.7 Installation/assembly

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

31989055/EN – 05/2025

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.

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).

2.9 Protective separation

The product meets all requirements for protective separation of power and electronics connections in accordance with IEC 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 protective measures must be taken. These protective measures are described in IEC 61800-5-1.

2.10 Startup/operation

Make sure that any existing transport protection is removed.

Do not deactivate monitoring and protection devices of the machine or system, even for a test run.

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

Additional preventive measures may be required for applications with increased hazard potential. Be sure to check the effectiveness of the protection devices after every modification.

In the event of deviations from normal operation, switch off the product. Possible deviations are increased temperatures, noise, or vibration, for example. Determine the cause. Contact SEW-EURODRIVE if necessary.

Do not separate the connection to the product during operation. This may result in dangerous electric arcs damaging the product.

When the system is switched on, dangerous voltages are present on all voltage-controlled product parts as well as any cables and terminals that are connected. This also applies even when the product is inhibited and the motor is in an idle state. Do not touch the components 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.

31989055/EN – 05/2025

Observe the corresponding information signs on the product.

The fact that the operation or 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. Removing the cause of this problem or performing a reset can result in the machine or the system re-starting on its own. First, disconnect the product from the supply system before you start troubleshooting.

Cover unused connections with the supplied protection caps during operation.

31989055/EN – 05/2025

3 Device structure

3.1 Type designation

FHM	**Field Controller Mobile**
35	**Mobile transport system**
A	**Version A**
–	
..	**Communication type** E4 = Ethernet W4 = WLAN (Single Card)
..	**Fieldbus interface** 01 = WLAN software package World 03 = WLAN software package USA/Canada 83 = Ethernet 1 × M12 100Mbit

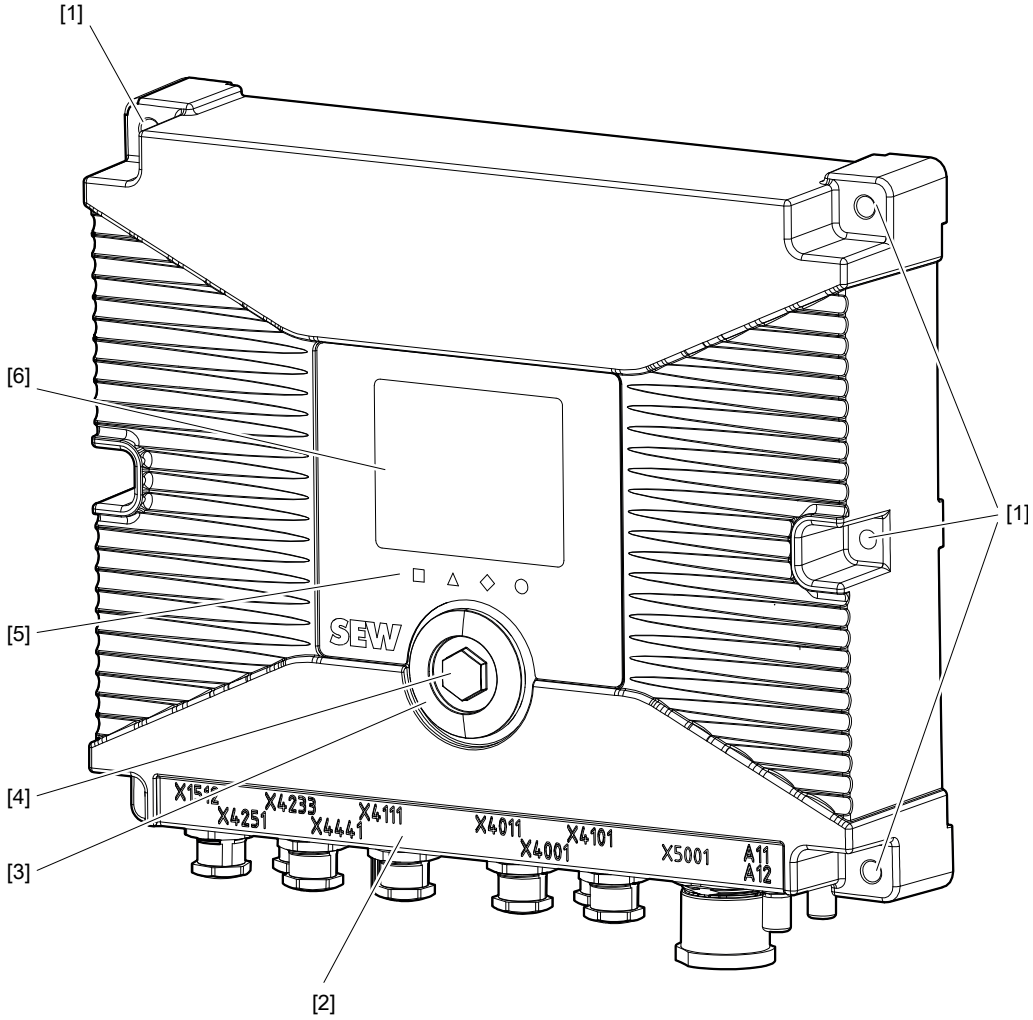
3.2 Scope of delivery

Component		Part number
1 × FIELD CONTROLLER MOBILE:		
	FHM35A-E483	28317378
	FHM35A-W401	28317386
	FHM35A-W403	28317394
Protective caps for all plug connectors		–

31989055/EN – 05/2025

3.3 Device overview

The following figure provides an exemplary overview of the most important device components:



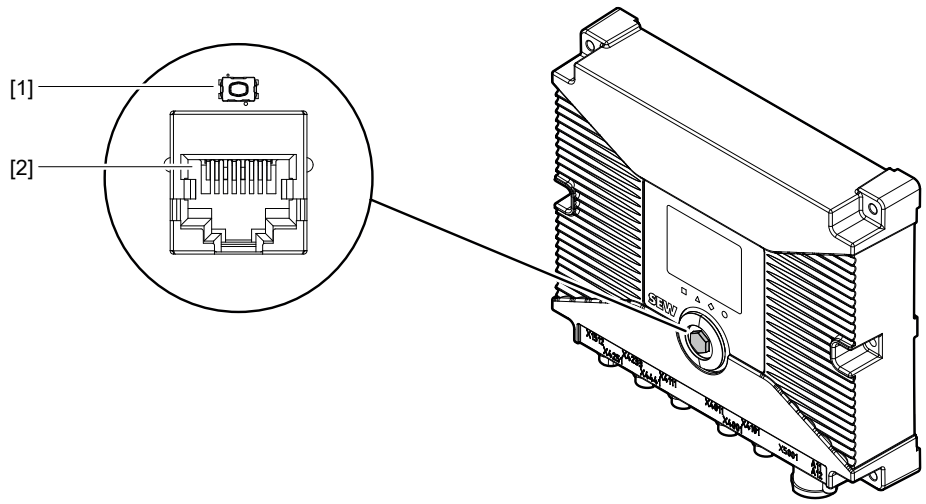
9007248958090891

[1] Mounting bores
[2] Connection block
[3] Status LED ring
[4] Screw plug for Ethernet service interface and reset pushbutton
[5] Status LEDs
[6] Status display with infrared interface

31989055/EN – 05/2025

3.3.1 Ethernet service interface

The Ethernet service interface and the reset pushbutton are behind the screw plug.



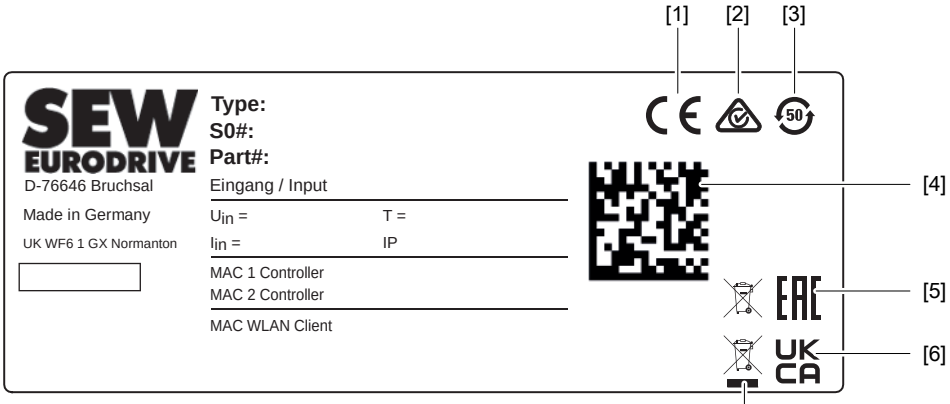
18014448333141515

[1] Reset pushbutton
[2] Ethernet service interface

31989055/EN – 05/2025

3.4 Nameplate

The nameplate lists information about the device type. The following figure shows an example of a nameplate:



[1] CE marking
[2] RCM marking
[3] China RoHS-2 marking
[4] Data matrix code with part number and production number
[5] EAC marking
[6] UKCA marking
[7] WEEE marking

Depending on the device design, the following information is listed on the nameplate:

Value	Information
Type	Type designation
SO#	Production number
Part#	Part number
U	Voltage
I	Current
T	Ambient temperature
IP	Degree of protection
CMIIT ID	ID for radio approval for the Chinese market
FCC ID	ID for radio approval for the U.S. market

31989055/EN – 05/2025

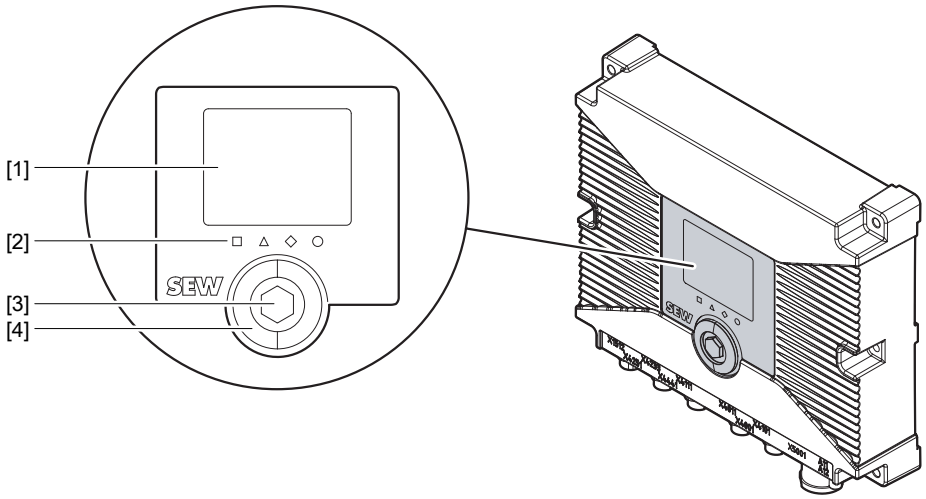
3.5 Functional principle

3.5.1 Control type

The device is equipped with a MNC45B controller.

3.5.2 Service unit

The service unit is used for startup, diagnostics and maintenance of the device. It is equipped with a status display and an Ethernet service interface. The following figure shows the service unit:



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[1] Status display with infrared interface
[2] Status LEDs
[3] Ethernet service interface, Ethernet RJ45
[4] Status LED ring

Status display and status LEDs

The status display and status LEDs display status or error messages and thus enable you to record the current state of the device.

For further information, refer to chapter "Status and error messages" (→ 🗎 46) and to the respective project-specific documentation. If you have any queries, contact SEW-EURODRIVE.

Ethernet service interface

The Ethernet service interface connects the device with an engineering PC for configuration and maintenance purposes.

For further information, refer to chapter "Connecting the engineering PC with the Ethernet service interface" (→ 🗎 50).

Infrared interface

You can use the infrared keypad to remotely control the device via the infrared interface. The infrared keypad is available as a separate accessory.

The infrared interface is not active in delivery state.

31989055/EN – 05/2025

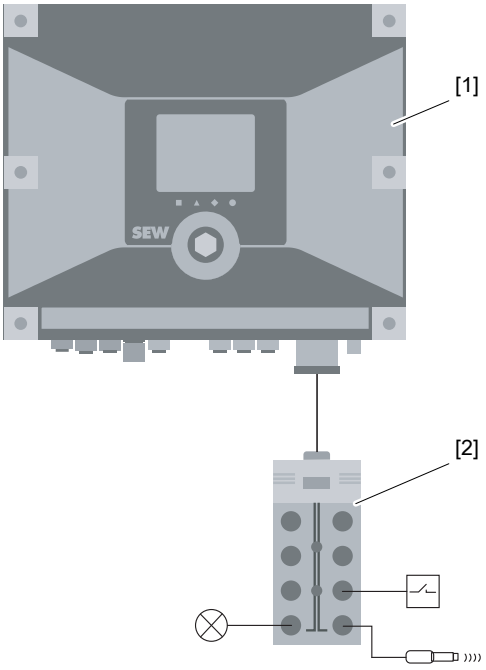
3.5.3 Fieldbus interface

The device is equipped with an UDP-capable Ethernet interface for connection to the fieldbus. The fieldbus connection is made via plug connectors. For further information, refer to chapter "Electrical connections" (→ 🗎 27).

The fieldbus interface is deactivated in delivery state.

3.5.4 Digital inputs and outputs

The device has connections for digital inputs and outputs. You connect the sensors and actuators required for your application to the digital inputs and outputs. To connect several sensors and actuators to the device at the same time, use the sensor/actuator box which is available as an accessory. For further information, refer to chapter "Accessories" (→ 🗎 20). The following figure shows an example of an sensor/actuator box connection:



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[1] Device
[2] Sensor/actuator box with M23 connector and M12 connections for e.g.:
- Switch
- Inductive sensors
- Light barriers
- Indicator lights

3.5.5 WLAN function

The following descriptions apply to devices with Wi-Fi function (type designation "W4"):

WLAN module

INFORMATION

Operation of the device with radio modem is only permitted indoors.

31989055/EN – 05/2025

The device has a radio module with Wi-Fi client functionality for connection to a wireless infrastructure network. Communication is based on the Wi-Fi 6 standard. A 5 GHz band based on the IEEE 802.11a standard is available.

The radio connection is intended for communication with the higher-level controller. The device can be reached in the network as an end station.

Functional description

Before logging into an access point for the first time and during handover, the radio modem searches for a suitable access point according to the user configuration. This phase is called "probing phase".

The probing phase during handover starts when the signal level of the radio modem drops below a certain value (cell search threshold). If the signal level of the detected access point is higher by a certain value (delta SNR) than the signal level of the current access point, the radio modem logs into the new access point (Association/Authentication/4-Way Handshake with WPA2-PSK). Process data communication is not possible during the probing and registration phase. The probing phase can be shortened by limiting the available channels according to the regulatory domain to the channels that exist in the plant.

Encryption

The device supports the following Wi-Fi security standards:

- WPA2-AES-PSK

WPA2-AES-PSK is recommended as an encryption method. Encryption methods using a Radius server are not recommended because of impractical latency times during login and connection transfer.

Antenna connections

The antenna connections are equivalent. You can configure the type of use.

Connect a 50 Ω terminating resistor to unused antenna connections. The part numbers of available antennas and terminating resistors as well as further information on the connections can be found in chapter "Electrical connections" (→ 🗎 27).

Further information

For additional information about the antennas in different areas of application, refer to the following documentation:

- "WNI Wireless Network Installation – Compact Slotted Waveguide System" installation instructions
- "WNI Wireless Network Installation – Standard Slotted Waveguide System" installation instructions
- "WNI Wireless Network Installation – Radiating Cable System" installation instructions
- "WNI Wireless Network Installation – EMS Mounting Rail System with Integrated Slotted Waveguide" installation instructions
- "WNI Wireless Network Installation – Configuration Wi-Fi via Slotted Waveguide" manual
- "MOVIPRO® Communication Material" operating instructions

31989055/EN – 05/2025

3.6 Accessories

3.6.1 Available accessories

INFORMATION

The scope of delivery does not include accessories, such as installation and mounting material or connection cables.

If you are unsure about the accessories you require, contact SEW-EURODRIVE. For further information on accessories, refer to the following documentation: "MOVIPRO® – Accessories" addendum to operating instructions. The following accessories are available for the device:

	Part number
Connection cable	
For information on connection cables for other components, refer to the corresponding connections in chapter "Electrical connections" (→ 🗎 27).	
Display unit	
For further information, refer to the following documentation: "MOVIPRO® Accessories PZO00A-SAZIR0-C000-03 Display Unit" addendum to the operating instructions.	
PZO00A-SAZIR0-C000-03	28249186
Antennas	
For further information, refer to chapter "Electrical connections" (→ 🗎 27).	
Near field coupler 2.4 GHz	13003356
Near field coupler 5 GHz	18231942
Vehicle coupler 2.4 GHz	18244327
Vehicle coupler 5 GHz	18235840
Connection component	
CAN terminating resistor 120 Ω	13287036
50 Ω terminating resistor (RP-SMA connector)	19051972
CAN T-piece	13290967
Keypad	
For further information, refer to the following documentation: "MOVIPRO® Accessories – PZO00A-BFBIR0-01/.. Keypad" operating instructions.	
PZO00A-BFBIR0-01/L001	17975972
PZO00A-BFBIR0-01/L002	17975980
PZO00A-BFBIR0-01/L003	17975999
PZO00A-BFBIR0-01/L004	17976006
PZO00A-BFBIR0-01/L005	17976014
M12 parameter memory	
M12 parameter memory	17976340
Mounting accessories	
For further information, refer to chapter "Mechanical installation" (→ 🗎 22).	

31989055/EN – 05/2025

	Part number
Sensor/actuator boxes For further information, refer to chapter "Electrical connections" (→ 🗎 27).	
Sensor/actuator box 1 m (4 connections)	18255477
Sensor/actuator box 3 m (4 connections)	18255485
Sensor/actuator box 1 m (8 connections)	13309269
Sensor/actuator box 2 m (8 connections)	13309277
Sensor/actuator box 3 m (8 connections)	13309285
Sensor/actuator box 5 m (8 connections)	13309293
Sensor/actuator box 10 m (8 connections)	13309307

31989055/EN – 05/2025

4 Mechanical installation

4.1 Requirements

- Trained specialists perform the installation.
- The information provided in the technical data and the permitted conditions for the operating location of the device are observed.
- The minimum clearance and the required gaps for using a mounting plate are complied with. For more information, refer to chapter "Minimum clearance" (→ 🗎 22).
- Only mount the device using the mounting options intended for it.
- The selection and dimensioning of the mounting and locking elements are in line with the applicable standards, the technical data of the devices, and the local requirements.
- The bore dimensions are calculated in line with the respective mounting type.
- The mounting and locking elements fit into the existing bores, threads, and countersinks.
- All display and actuator elements are visible and accessible after installation.
- The device is positioned in a way that it will not collide with other components or design elements along the travel path.
- Fasten the device so that it is not exposed to shocks or vibrations during operation that exceed loads according to DIN EN 60721-3-3/-5 3M7/5M2.

4.2 Permitted mounting positions

Position the device so that it will not collide with other components or design elements.

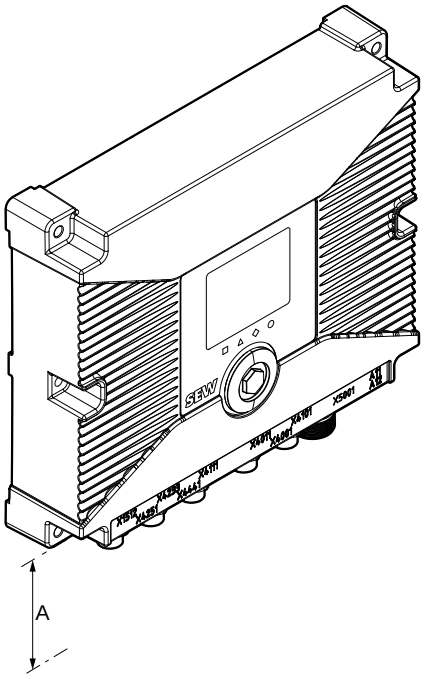
All mounting positions are permitted.

4.3 Minimum clearance

INFORMATION

- Observe the following required minimum clearances during installation:
  - When connecting the cables and plug connectors
  - When handling the display, diagnostics, and operating elements
  - For heat convection at the cooling fins if the product has cooling fins
- Further information on the required minimum clearances can be found in the dimension drawings in chapter "Technical data".

31989055/EN – 05/2025



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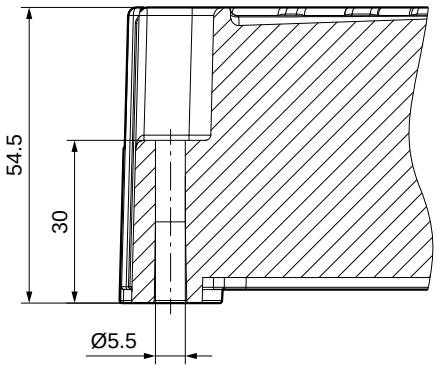
Clearance	Function	Size
A	Space for connection cables and plug connectors	> 100 mm

4.4 Mounting

The device has 6 through bores with a diameter of 5.5 mm for mounting. The following figure shows the structure of the through bores with dimensions in mm.



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4.4.1 Mounting the device

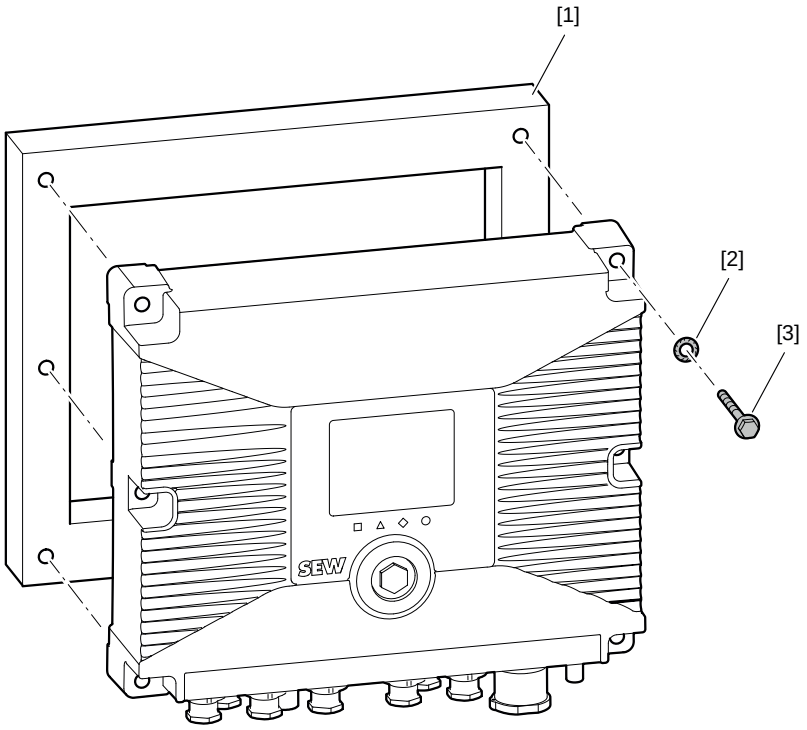
You can attach the device to the mounting surface from the front. If the device is subject to vibration or shock loads during use, store the device on suitable rubber buffers.

✓ Required material: 6 × M5 screws of suitable length and suitable locks, e.g. tooth lock washers

1. Mark the bores on the mounting surface. For dimensions and bore distances, refer to chapter "Dimension drawing" (→ 🗎 67).

31989055/EN – 05/2025

2. Make tapped holes on the mounting surface.
3. ⚠ **CAUTION!** Risk of injury due to incorrect mounting. Minor injuries.
   Attach the device to at least 4 of the 6 designated mounting holes. Screw the device onto the mounting surface [1] using M5 screws [3] and locking elements [2]. Tighten the screws with a tightening torque of 5.7 Nm.



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[1] Mounting surface, e.g. mounting plate
[2] Locking elements, e.g. tooth lock washer
[3] M5 screws

Mounting the device using mounting rails

If the device is subject to vibration or shock loads during use, mount the device on mounting rails with suitable rubber buffers.

31989055/EN – 05/2025

5 Electrical installation

5.1 Electromagnetic compatibility (EMC)

For further information on EMC-compliant installation, refer to the following documentation: "Drive Engineering – Practical Implementation, Electromagnetic Compatibility (EMC) in Drive Engineering".

5.1.1 EMC category

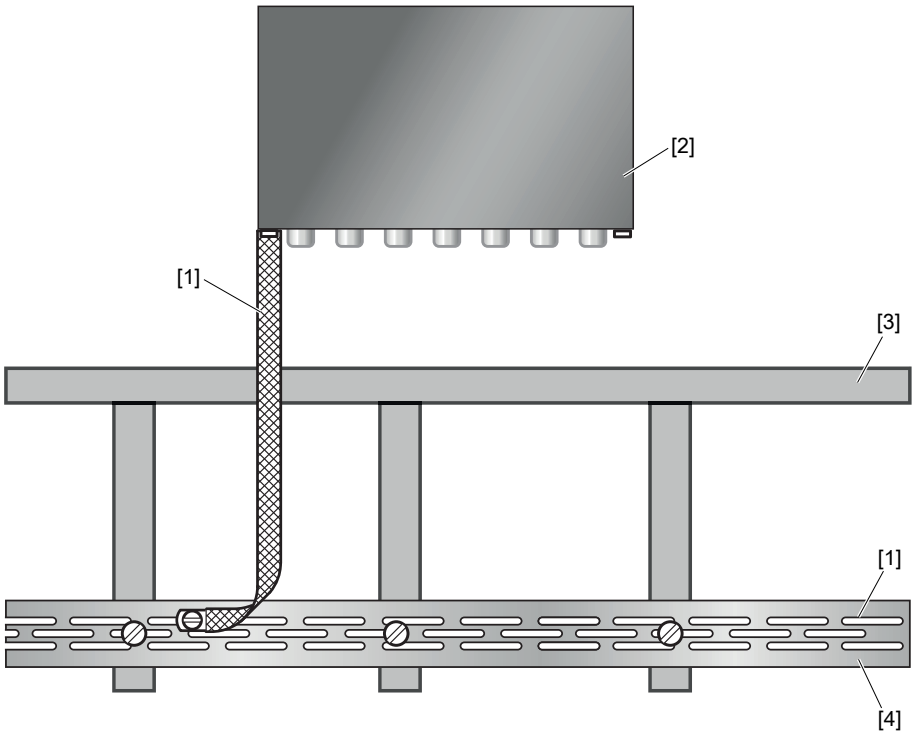
INFORMATION

The product can cause EMC interference within the permitted limit range according to EN 61800-3.

5.1.2 EMC-compliant installation

Ensure that there is a HF-capable equipotential bonding for all drive components. Use low-impedance, HF-capable connectors such as HF litz wire or ground straps. Standard protective earth conductors do not achieve sufficient equipotential bonding regarding HF and EMC.

Install the equipotential bonding at the FE connection of the connection block.



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[1]	HF litz wire, ground strap	[3]	Machine base / vehicle support frame
[2]	Product	[4]	Cable duct

31989055/EN – 05/2025

5.2 Cable routing

- Only use suitable cables for connecting the power supply and for communication.
- Avoid using long cables running parallel to one another.

For more information on EMC-compliant installation, refer to the following documentation: "Drive Engineering – Practical Implementation, EMC in Drive Engineering".

5.3 Shielding

- Use shielded electronic cables.
- Connect the shield to ground on both sides with flat contact. In the case of multiple-shielded cables, also connect the inner shields to ground on both sides with a flat contact.
- Use EMC-capable plug connectors.
- For external bus connections, refer to the bus-specific installation instructions.

5.4 Using prefabricated cables

SEW-EURODRIVE uses prefabricated cables for certifications, type tests and approval of the devices. The cables available from SEW-EURODRIVE meet all the requirements necessary for the functions of the device and the connected components. The devices under consideration are always the basic devices including all components to be connected and corresponding connection cables.

For this reason, SEW-EURODRIVE recommends that you only use the prefabricated cables listed in the documentation.

5.4.1 Using third-party cables

If third-party cables are used – even if these cables are technically equivalent – SEW-EURODRIVE will not accept any liability and cannot guarantee compliance with device properties or that the device will function correctly.

If you use third-party cables for connecting the device and connected components, ensure their compliance with applicable national regulations. Note that the technical features of the device or unit network might be affected inadvertently when using third-party cables. This concerns in particular the following properties:

- Mechanical properties (e.g. IP degree of protection, cable carrier suitability)
- Chemical properties (e.g. silicone and halogen free, resistance to substances)
- Thermal properties (e.g. thermal stability, increase in device temperature, flammability class)
- EMC behavior (such as interference emission limit values, compliance with interference immunity values stipulated in standards)
- Functional safety (approvals according to EN ISO 13849-1)

Third-party cables not explicitly recommended by SEW-EURODRIVE must meet at least the requirements of the following standards and have been permitted according to these standards:

- IEC 60309

31989055/EN – 05/2025

- IEC 61984
- IEC 60204

5.5 Installing terminating resistors on antenna connections

Terminating resistors must be installed on unused antenna connections.

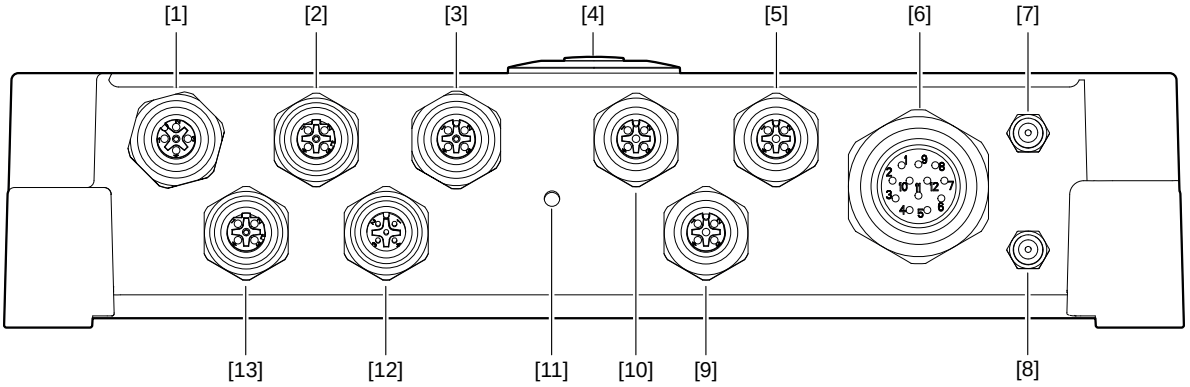
Proceed as follows:

✓ Required tools: Torque wrench for SMA plug connector (wrench width 8 mm)

1. Tighten the terminating resistors with a torque of 1 Nm.

5.6 Connection block

The connection designations can be found as labels on the top of the device. Make sure that the latches of the connections engage after you plugged the plug connectors into the connections.



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[1]	X1512	DC 24 V input
[2]	X4233	Ethernet fieldbus
[3]	X4111	CAN bus – external
[4]	X4223	Ethernet service interface (4-pin)
[5]	X4101	CAN bus – system bus
[6]	X5001	Digital inputs/outputs of the communication and control unit
[7]	A11	Wi-Fi port (optional)
[8]	A12	Wi-Fi port (optional)
[9]	X4001	RS485 interface – system bus
[10]	X4011	RS485 interface – external
[11]	FE	Equipotential bonding / functional earth
[12]	X4441	M12 parameter memory
[13]	X4251	SBus^{PLUS} system bus

5.7 Electrical connections

5.7.1 Representation of connections

The wiring diagrams show the contact end of the connections.

31989055/EN – 05/2025

5.7.2 Cable structure

Diagram

The following table shows the cable structure based on an example:

Figure	Meaning
(	Cable shield
4	Number of core pairs (in twisted cables only)
X	
2	Number of cores
X	G – with protective earth, green-yellow X - without protective earth
0.25	Core cross section in mm^2
)	Cable shield
+	A plus sign is added to cores with other features.
…	

Examples

The following examples illustrate the cable structure:

- **3G1.5:**

  Cable with 3 cores of 1.5 mm^2 each, one of them is a green-yellow PE conductor.
- **((2X2X0.25)+4G2.5):**

  Shielded hybrid cable with
  - 4 twisted-pair cables of 0.25 mm^2 each, shielded, and
  - 4 power cores of 2.5 mm^2 each, one of them is a green-yellow PE conductor.

5.7.3 Connection cables

INFORMATION

For more information about cable types, see chapter "Technical data" (→ 🗎 54).

Connection cables are not included in the delivery. Prefabricated cables for connecting SEW-EURODRIVE components are available to order. For each connection, the available prefabricated cables are listed. Specify the part number and length of the required cable in your order.

The number and design of the required connection cables depend on the design of the devices and the components to be connected. This is why you do not need all listed cables.

31989055/EN – 05/2025

Cable types

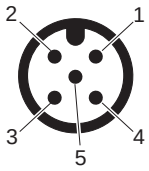
The table below shows the depictions used and what they mean:

Depiction	Meaning
	Fixed length
	Variable length
	Suitable for cable carriers
	Not suitable for cable carriers

5.7.4 X1512: DC 24 V input

Function
DC 24 V unit supply input

Connection type
M12, 5-pin, male, A-coded

Connection diagram


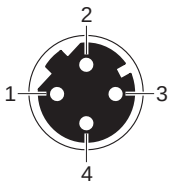
Assignment		
Contact	**Function**	
1	+24V	DC 24 V input
2	res.	Reserved
3	0V24	0V24 reference potential
4	res.	Reserved
5	res.	Reserved

31989055/EN – 05/2025

5.7.5 X4233: Ethernet fieldbus

Function
Ethernet fieldbus interface, 4-pin

Connection type
M12, 4-pin, female, D-coded

Connection diagram


Assignment		
1	TX+	Sending cable (+)
2	RX+	Receiving cable (+)
3	TX-	Sending cable (-)
4	RX-	Receiving cable (-)

Connection cable

Cable	Length/installation type	Component
Part number: 19105401 Cable design: (2X2X0.14)  M12, 4-pin, D-coded, male ↔ M12, 4-pin, D-coded, female	Fixed length 2 m 	–

31989055/EN – 05/2025

5.7.6 X4111: CAN bus – external

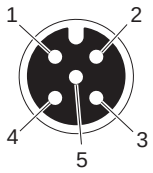
INFORMATION

If there is no station connected here, you must terminate the bus with a 120 Ω resistor.

Function
CAN bus for external components

Connection type
M12, 5-pin, female, A-coded

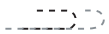
Connection diagram



Assignment		
Contact	**Function**	
1	CAN_SHLD	Shield/equipotential bonding CAN bus
2	+24V	DC 24 V output
3	GND	Reference potential
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

31989055/EN – 05/2025

Connection cables

Cable	Length/installation type	Component
Standard lengths: 1 m: Part number: 13237748 2 m: Part number: 13237756 3 m: Part number: 13286315 4 m: Part number: 13286323 5 m: Part number: 13286331 10 m: Part number: 13286358 15 m: Part number: 13286366 **Order-specific lengths:** 1.5 m: Part number: 13286293 2.5 m: Part number: 13286307 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12, male, A-coded ↔ M12, female, A-coded	Fixed length 	–
Standard lengths: 2 m: Part number: 13281364 5 m: Part number: 13281402 **Order-specific lengths:** 1 m: Part number: 13281348 1.5 m: Part number: 13281356 2.5 m: Part number: 13281372 3 m: Part number: 13281380 4 m: Part number: 13281399 10 m: Part number: 13281410 15 m: Part number: 13281429 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12, male, A-coded ↔ open	Fixed length 	–

31989055/EN – 05/2025

Conductor assignment

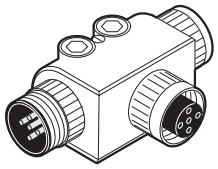
Part number	Signal name	Conductor color
13281348	CAN_SHLD	–
13281356	+24V	Red
13281364	GND	Black
13281372	CAN_H	White
13281380	CAN_L	Blue
13281399		
13281402		
13281410		
13281429		

Connection components

CAN T-piece

Part number: 13290967

Connection: M12

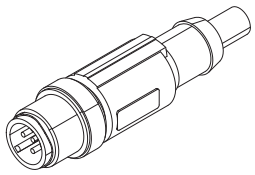


9007204911485067

CAN terminating resistor

Part number: 13287036

Connection: M12



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31989055/EN – 05/2025

5.7.7 X4223: Ethernet service interface

Function
Ethernet service interface of the communication and control unit

Connection type
Ethernet RJ45

Connection diagram


Assignment		
Contact	**Function**	
1	D1+	Data line 1 (+)
2	D1-	Data line 1 (-)
3	D2+	Data line 2 (+)
4	D3+	Data line 3 (+)
5	D3-	Data line 3 (-)
6	D2-	Data line 2 (-)
7	D4+	Data line 4 (+)
8	D4-	Data line 4 (-)

31989055/EN – 05/2025

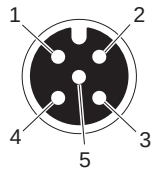
5.7.8 X4101: CAN bus – system bus

INFORMATION

If there is no station connected here, you must terminate the bus with a 120 Ω resistor.

Function
CAN system bus – output

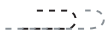
Connection type
M12, 5-pin, female, A-coded

Connection diagram


Assignment		
Contact	**Function**	
1	CAN_SHLD	Shield/equipotential bonding CAN bus
2	+24V	DC 24 V output
3	GND	Reference potential
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

31989055/EN – 05/2025

Connection cables

Cable	Length/installation type	Component
Standard lengths: 1 m: Part number: 13237748 2 m: Part number: 13237756 3 m: Part number: 13286315 4 m: Part number: 13286323 5 m: Part number: 13286331 10 m: Part number: 13286358 15 m: Part number: 13286366 **Order-specific lengths:** 1.5 m: Part number: 13286293 2.5 m: Part number: 13286307 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12, male, A-coded ↔ M12, female, A-coded	Fixed length 	–
Standard lengths: 2 m: Part number: 13281364 5 m: Part number: 13281402 **Order-specific lengths:** 1 m: Part number: 13281348 1.5 m: Part number: 13281356 2.5 m: Part number: 13281372 3 m: Part number: 13281380 4 m: Part number: 13281399 10 m: Part number: 13281410 15 m: Part number: 13281429 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12, male, A-coded ↔ open	Fixed length 	–

31989055/EN – 05/2025

Conductor assignment

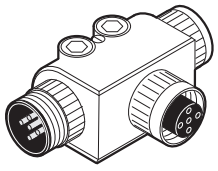
Part number	Signal name	Conductor color
13281348	CAN_SHLD	–
13281356	+24V	Red
13281364	GND	Black
13281372	CAN_H	White
13281380	CAN_L	Blue
13281399		
13281402		
13281410		
13281429		

Connection components

CAN T-piece

Part number: 13290967

Connection: M12

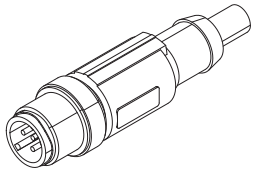


9007204911485067

CAN terminating resistor

Part number: 13287036

Connection: M12

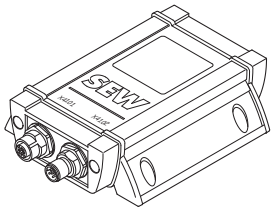


22822010891

PZO00A-SAZIR0-C000-03 display unit

Part number: 28249186

Connection: M12



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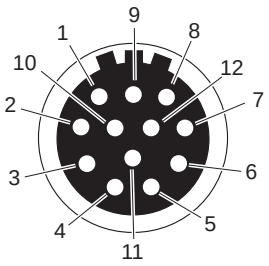
31989055/EN – 05/2025

5.7.9 X5001: Digital inputs/outputs

Function
Digital inputs/outputs of the communication and control unit

Connection type
M23, insulator, P part 12-pin, female, 0°-coded

Connection diagram



Assignment

Contact	Function	
1	DI00/DO00	Data reception direction 01/Digital output 01
2	DI01/DO01	Data reception direction 02/Digital output 02
3	DI02/DO02	Data reception direction 03/Digital output 03
4	DI03/DO03	Data reception direction 04/Digital output 04
5	DI04/DO04	Data reception direction 05/Digital output 05
6	DI05/DO05	Data reception direction 06/Digital output 06
7	DI06/DO06	Data reception direction 07/Digital output 07
8	DI07/DO07	Data reception direction 08/Digital output 08
9	0V24	0V24 reference potential
10	0V24	0V24 reference potential
11	+24V	DC 24 V output
12	FE	Equipotential bonding / functional earth

31989055/EN – 05/2025

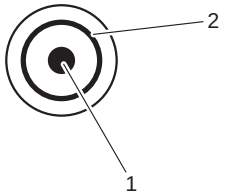
5.7.10 A11: WLAN port A

INFORMATION

If you do not use the connection, assign a 50 Ω resistor to it.

Function
Antenna connection of the WLAN module, send and receive functionality

Connection type
Socket connector RP-SMA

Connection diagram


Assignment		
Contact	**Function**	
1	inner conductor	Inner conductor
2	outer conductor	Outer conductor

Connection components

Antennas

The following table lists all the antennas available from SEW-EURODRIVE that can be used with the device:

Antenna	For use with	Part number
Coupler radiating cable R-SMA 2.4 GHz	Radiating cable	13003356
Coupler radiating cable R-SMA 5 GHz	Radiating cable	18231942
Coupler waveguide R-SMA 2.4 GHz	Slotted waveguide	18244327
Coupler waveguide R-SMA 5 GHz	Slotted waveguide	18235840

Operation with other kinds of antenna is not permitted.

50 Ω terminating resistor

Part number: 19051972

Connection: RP-SMA connector

31989055/EN – 05/2025

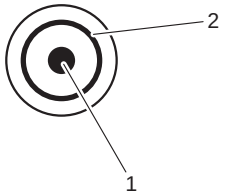
5.7.11 A12: WLAN port B

INFORMATION

If you do not use the connection, assign a 50 Ω resistor to it.

Assignment
Antenna connection of the WLAN module, send and receive functionality

Connection type
Socket connector RP-SMA

Connection diagram


Assignment		
Contact	**Function**	
1	inner conductor	Inner conductor
2	outer conductor	Outer conductor

Connection components

Antennas

The following table lists all the antennas available from SEW-EURODRIVE that can be used with the device:

Antenna	For use with	Part number
Coupler radiating cable R-SMA 2.4 GHz	Radiating cable	13003356
Coupler radiating cable R-SMA 5 GHz	Radiating cable	18231942
Coupler waveguide R-SMA 2.4 GHz	Slotted waveguide	18244327
Coupler waveguide R-SMA 5 GHz	Slotted waveguide	18235840

Operation with other kinds of antenna is not permitted.

50 Ω terminating resistor

Part number: 19051972

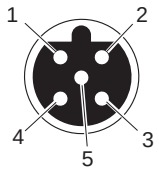
Connection: RP-SMA connector

31989055/EN – 05/2025

5.7.12 X4001: RS485 interface – system bus

Function
Internal RS485 interface (system bus)

Connection type
M12, 5-pin, female, B-coded

Connection diagram


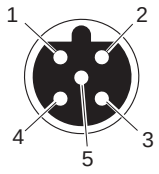
Assignment		
Contact	**Function**	
1	+24V	DC 24 V output
2	RS-	RS485 data line (-)
3	GND	Reference potential
4	RS+	RS485 data line (+)
5	res.	Reserved

31989055/EN – 05/2025

5.7.13 X4011: RS485 interface – external

Function
RS485 interface for external components

Connection type
M12, 5-pin, female, B-coded

Connection diagram


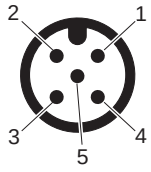
Assignment		
Contact	**Function**	
1	+24V	DC 24 V output
2	RS-	RS485 data line (-)
3	GND	Reference potential
4	RS+	RS485 data line (+)
5	res.	Reserved

31989055/EN – 05/2025

5.7.14 X4441: M12 parameter memory

Function
Interface for connecting the M12 parameter memory

Connection type
M12, 5-pin, male, A-coded

Connection diagram


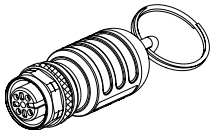
Assignment		
Contact	**Function**	
1	GND	Reference potential
2	+5V	DC 5 V output
3	D-	Data line (-)
4	D+	Data line (+)
5	res.	Reserved

Connection component

M12 parameter memory

Part number: 17976340

Connection: M12



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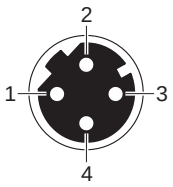
31989055/EN – 05/2025

5.7.15 X4251: SBus^{PLUS} system bus

Function
EtherCAT®-based SEW system bus SBus^{PLUS}

Connection type
M12, 4-pin, female, D-coded

Connection diagram


Assignment		
Contact	**Function**	
1	TX+	Sending cable (+)
2	RX+	Receiving cable (+)
3	TX-	Sending cable (-)
4	RX-	Receiving cable (-)

31989055/EN – 05/2025

6 Startup

6.1 Startup procedure

For information about startup, refer to the "MOVIVISION® – parameterizable plant software" system description.

31989055/EN – 05/2025

7 Operation

7.1 Status and error messages

7.1.1 Status display

The device's status display shows the current operating status. There are two kinds of status and error messages: from the device and from the user program. Status and error messages from the device are issued when no user program is active.

For more information on possible status and error messages of the user program, refer to the respective project-specific documentation. If you have any queries, contact SEW-EURODRIVE.

INFORMATION

If the timeout monitoring function of the status display is switched off, the last status issued by the user program is shown.

Only switch off the timeout monitoring function in exceptional cases. Inform the operating personnel accordingly.

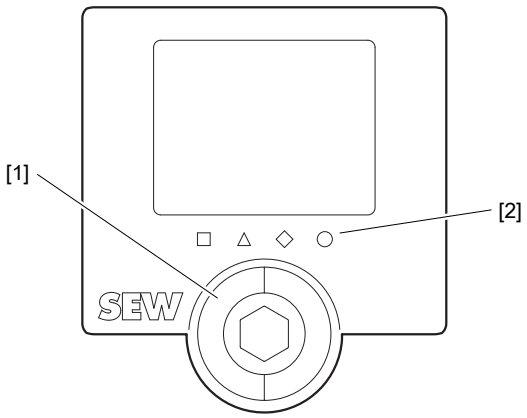
The following table shows the status and error messages of the device:

Code	Possible cause	Measure
SEW	DC 24 V voltage supply of the communication and control unit is present.	–
.....	The user program has not updated the values of the status display within 3 s. There is an error in the user program, in the device, or in the internal system bus.	• Restart the device. Check whether the device starts correctly. If the device does not start, reload the user program into the device. • If the status message is repeatedly shown in operation, contact SEW-EURODRIVE service.
SF 888	The device cannot boot after switch-on. The communication and control unit of the device is defective or has a serious error.	Contact SEW-EURODRIVE Service.
SF 881	• The device cannot find a valid system image. • The internal memory of the communication and control unit is faulty.	Contact SEW-EURODRIVE Service.

31989055/EN – 05/2025

7.1.2 Status LEDs

The status LEDs display the current operating state.



9007248228715403

[1] Status LED ring
[2] Status LEDs "Square □", "Delta △", "Diamond ◇", "Circle ○"

Status LED ring

The status LED ring can be easily seen even from a longer distance and shows the application status roughly.

State	Meaning	Measure
Red	An error is present.	For more detailed information, refer to the status display and the other status LEDs.

Further states can be defined project-specifically via the application software.

"Square □" status LED

State	Meaning	Measure
Off	The MNC45B controller is not supplied with voltage.	Check the backup voltage at the X1512 signal feed connector.
Red	The device cannot boot after switch-on. The communication and control unit of the device is defective or has a serious error.	Contact SEW-EURODRIVE Service.
Flashes red	The firmware is faulty.	Contact SEW-EURODRIVE Service.
Orange	• The product cannot find a valid system image. • The internal memory of the communication and control unit is faulty.	Contact SEW-EURODRIVE Service.
Green	The firmware has booted. The product is ready for operation.	–

31989055/EN – 05/2025

"Delta △" status LED – application software

The status LED is controlled by the application software on a project-specific basis.

“Diamond ◇“ status LED – application software

The status LED is controlled by the application software on a project-specific basis.

"Circle ○" status LED – fieldbus

State	Meaning	Measure
LED off	Wi-Fi is switched off, e.g. in delivery state.	–
LED flashes green	Wi-Fi searches for a network (scanning/probing).	–
LED permanently green	Wi-Fi is connected to an access point.	–

7.2 Fault information

7.2.1 For your information

In the MOVIVISION® plant software, all active errors or errors that have not been acknowledged yet are displayed in plain text at the node for the inverter. For further information, refer to the following documentation: “Parameterizable Plant Software MOVIVISION® – Error Messages in Connection with a MAXOLUTION® System Solution” manual.

7.2.2 Acknowledging fault messages

The drive may restart automatically depending on the setting after fault elimination or after a reset. Establish a safe working environment before eliminating a fault if automatic restart of the driven machine is not permitted for safety reasons.

Acknowledging in the application software

Error messages are acknowledged via the project-specific application software.

7.3 IT security

7.3.1 Hardening measures

Perform the following hardening measures:

- 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 fault memories and diagnostics information of your products regularly and check whether there are entries that affect IT security.

31989055/EN – 05/2025

7.3.2 Guidelines for secure operation

Various service accesses can be activated on the device. Authentication is implemented by using user-defined access data. This data is not used to defend against attacks on IT security, but rather to protect against unintentional modification. This is the reason why it cannot be changed.

To prevent misuse of the service access, network access must be restricted according to state-of-the-art technology. For more information, refer to section "IT security of the environment" (→ 🗎 9).

7.3.3 Guidelines for user account management

The product uses various administrative service accounts. These are not relevant for operation and are only used for service purposes. The account is protected by static device-specific access data.

31989055/EN – 05/2025

8 Service

8.1 SEW-EURODRIVE Service

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

8.2 Inspection/maintenance

INFORMATION

Never open the device. Only SEW-EURODRIVE may perform repairs.

The device is maintenance-free. SEW-EURODRIVE does not stipulate any regular inspection work. However, it is recommended that you check the following components regularly:

- Connection cables:

  If cables become damaged or fatigued, replace them immediately.
- Cooling fins (if available):

  Remove any deposits to ensure sufficient cooling.
- Fans (if available):

  Check whether the fans function properly.

8.3 Connecting the engineering PC with the Ethernet service interface

✓ Required material: Ethernet cables with RJ45 plug connectors. SEW-EURODRIVE recommends using an Ethernet cable with an extended locking lever (e.g. by Harting).

✓ Required tools: Wrench with wrench size 13

1. Remove the screw plug using the wrench.
2. Plug an RJ45 plug connector of the Ethernet cable into the Ethernet service interface.
3. Plug the other RJ45 plug connector of the Ethernet cable into the Ethernet interface of the engineering PC.

31989055/EN – 05/2025

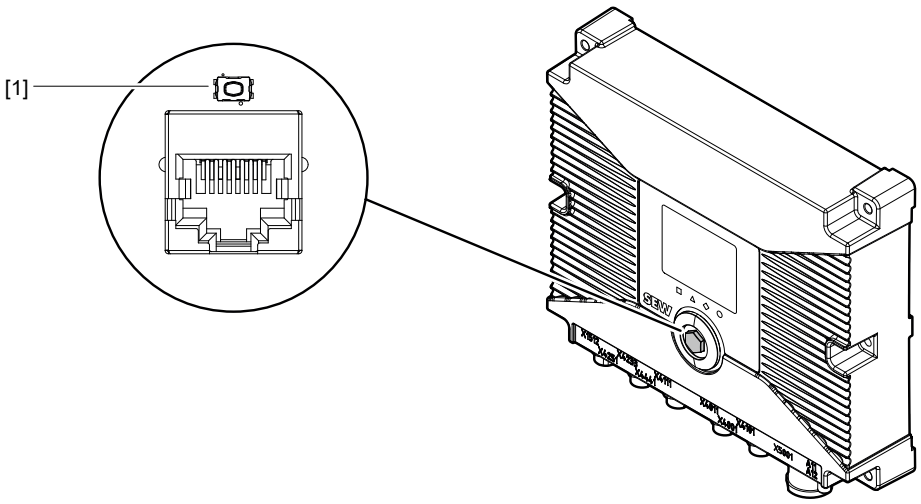
Addresses

- Standard IP address: 192.168.10.4
- Subnet mask: 255.255.255.0

8.4 Resetting the device software to factory state

✓ Required tools: Wrench with wrench size 13

1. If available, disconnect the M12 parameter memory from connection X4441. The parameter memory must not be reconnected during reset.
2. Remove the screw plug using the wrench.
3. Press the reset pushbutton [1] 4 times within 2 s.



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⇨ The device software is reset to the factory state.

8.5 Storage

Observe the following information when shutting down or storing the device:

- Cover the connections with the supplied protection caps.
- Place the device on a side without connectors.
- Ensure that the device is not subject to mechanical impact.
- Observe the information on storage temperature in chapter "Technical data" (→ 🗎 54).

8.6 IT security guidelines for secure disposal

8.6.1 Removing the product from its intended environment

If the data stored on the product is considered relevant for IT security, remove it as described in the section "Secure removal of data stored in the product." (→ 🗎 52)

31989055/EN – 05/2025

8.6.2 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.

8.6.3 Secure removal of data stored in the product

You can reset the data saved in the product to the factory settings using the reset pushbutton.

This encompasses the following data, if available on the device variant:

- Configuration of the device
- Device name
- IP address
- Log files
- Application software
- Control parameters

8.6.4 Removing a customer data backup

You can delete a customer data backup using the MOVIVISION® software.

Some of the data of the product is stored on removable storage media. If the data on the removable storage medium is classified as sensitive data from the operator's point of view and is not intended for later use, it can be deleted using the MOVIVISION® software before waste disposal.

8.7 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

31989055/EN – 05/2025

- 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 in accordance with Battery Regulation 2023/1542

This product contains batteries or accumulators. Dispose of this product and the batteries or accumulators separately from the municipal waste in accordance with the national regulations.

31989055/EN – 05/2025

9 Technical data

9.1 Marks

9.1.1 Basic device

The device complies with the following regulations and guidelines:

Mark	Definition
CE	CE marking to state compliance with European Directives, (see EU declaration of conformity or EU declaration of incorporation).
	Products and accessories may fall within the scope of the country-specific transposition of the WEEE Directive. Dispose of the product and its accessories in accordance with the national regulations of your country.
EAC	The EAC mark indicates compliance with the requirements of the technical regulations of the Customs Union (Eurasian Economic Union), Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia.
	The China RoHS mark indicates compliance with the directive SJ/ T 11364-2014 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment and its packaging.
UK CA	The UKCA mark indicates compliance with British directives (see UK declaration of conformity or UK declaration of incorporation).

Depending on the product variant, additional markings for radio approval may be present. For further information, refer to chapter "Radio approvals" (→ 🗎 58).

9.2 General

Basic unit		
Interference immunity		Complies with EN 61800-3
Interference emission		Limit value class C3 according to EN 61800-3
Ambient temperature	ϑ_A	-25 – +40 °C (non-condensing, no moisture condensation)
Ambient temperature derating		EN 60721-3-3
Climate class		Class 3K3
Storage temperature	ϑ_S	-25 – +70 °C
Degree of protection		IP54
Mass		2.50 kg
Dimensions W × H × D		253 × 210 × 58 mm

31989055/EN – 05/2025

9.3 Input data

Basic unit		
Input voltage range	V_{IN}	DC 24 V +20%/-15% (according to IEC 61131-2)
Nominal input current		≤ 0.25 A
Total current consumption		Internal consumption + output currents on buses and I/Os

All reference potentials ("0V24", "GND") are connected with low impedance.

9.4 Communication and control unit

9.4.1 Control type

INFORMATION

The overall output power of the 24 V voltage supply at the plug connectors for buses and digital inputs/outputs must not exceed 48 W.

Type	MNC45B
Engineering	Engineering is performed via the Ethernet service interface and the plant software MOVIVISION®.

Binary inputs	
Compatibility	PLC-compatible according to IEC 61131-2:2008-04 type 3 "Standard operating ranges for digital inputs (current sinking)"
Internal resistance	≈ 4.5 kΩ
Current consumption	≈ 5.3 mA
High level	DC +13 V to +30 V
Low level	DC -3 V to +5 V
Switch-on delay	typ. 250 µs
Power off delay	typ. 250 µs

Binary outputs	
Compatibility	PLC-compatible to IEC 61131-2:2008-04 "Rated values and operating ranges for current sourcing digital a.c. outputs" All outputs are short-circuit proof, protected against overload and external-voltage-proof up to 30 V.
Nominal current	Max. DC 500 mA per digital output
Output current limit	Maximum 1.1 A
Inductive loads	Dissipation of inductive switch-off energy up to 1 J per output at X5001 Freewheeling diodes are not integrated.
Low level	DC 0 V
High level	DC 24 V ± 10%
Switch-on delay	typ. 100 µs
Power off delay	typ. 150 µs

31989055/EN – 05/2025

24 V voltage supply for buses	
Nominal voltage	DC 24 V ± 10%
Nominal current	Max. DC 500 mA per connection
Output current limit	Maximum 1.1 A The continuous output current must not exceed 500 mA.

9.4.2 Ethernet interfaces

Ethernet interfaces X4223, X4233, X4251		
Format		IEEE 802.3
	X4223	10BASE-T, 100BASE-TX, 1000BASE-T
	X4233, X4251	10BASE-T, 100BASE-TX
Maximum cable length		100 m according to IEEE 802.3

9.4.3 CAN interfaces

CAN interfaces X4101, X4111	
General	According to CAN specification 2.9, parts A and B Transmission technology according to ISO 11898 A maximum of 64 stations
Baud rate	125 kB – 1 MB
Maximum cable length	Depends on the baud rate according to CAN specification
Bus termination	120 ohm internal termination

9.4.4 RS485 interfaces

RS485 interfaces X4011/X4001	
General	EIA485 standard
Baud rate	2.4 – 115.2 kBaud
Bus termination	The interface is terminated internally with a dynamic terminating resistor.

9.5 WLAN module

9.5.1 General

General	
Maximum permitted input power without damage	+2 dBm
Maximum permitted input power for interference-free reception	-35 dBm
Impedance	50 Ω
Connections	RP-SMA socket

31989055/EN – 05/2025

Modulation type (IEEE 802.11a)		
Data rate	**Modulation**	**Mode**
54/48 Mbps	64-QAM	802.11a
36/24 Mbps	16-QAM	802.11a
18/12 Mbps	QPSK	802.11a
9/6 Mbps	BPSK	802.11a

Typical receiver sensitivity (IEEE 802.11a)	
Data rate	**Sensitivity**
54 Mbps	-75 dBm
48 Mbps	-77 dBm
36 Mbps	-81 dBm
24 Mbps	-84 dBm
18 Mbps	-87 dBm
12 Mbps	-89 dBm
9 Mbps	-91 dBm
6 Mbps	-92 dBm

9.5.2 Power ratings and channels

Region	802.11 standard MHz	Typical output power dBM	Available channels	DFS
China	IEEE 802.11a 5150 to 5250	15	36, 40, 44, 48	No
Europe, USA, Canada	IEEE 802.11a 5150 to 5250	15	36, 40, 44, 48	No

9.5.3 Factory settings

Setting	Value
WLAN interface	Deactivated

31989055/EN – 05/2025

9.5.4 Radio approvals

Europe

SEW-EURODRIVE GmbH & Co KG hereby declares that the device complies with the basic requirements and other relevant regulations of directive 2014/53/EU.

Additional national regulations apply for compliance with the RE directive 2014/53/EU (RED – Radio Equipment Directive). At the time this documentation was created, there were no restrictions regarding startup for any of the member states or requirements to be fulfilled for permission of use according to article 10 paragraph 10 of directive 2014/53/EU.

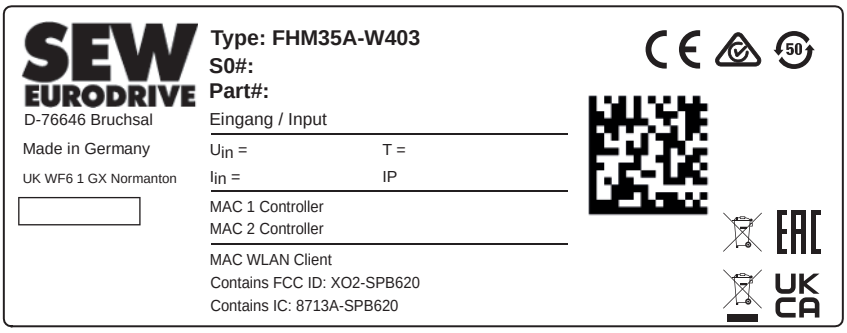
USA

The following statements and conformity assumptions under FCC rules are only applicable for the following equipment:

- FHM35A-W403, part number 28317394

The label identification is as follows:

- Contains FCC ID: XO2-SPB620



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FCC Compliance:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement:

To comply with FCC RF exposure compliance requirements, the device must be installed to provide a separation distance of at least 20 cm from all persons.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other radio devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

31989055/EN – 05/2025

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult SEW-EURODRIVE service.

Antenna:

The end-user product will be professionally installed in such a manner that only the authorized antennas are used:

Part number	Type	Gain 2.4 GHz	Gain 5 GHz
13003356	Coupler leaky-wave R-SMA 2.4 GHz	2.7 dBi	–
18231942	Coupler leaky-wave R-SMA 5 GHz	–	4.6 dBi
18244327	Coupler waveguide R-SMA 2.4 GHz	2.4 dBi	–
18235840	Coupler waveguide R-SMA 5 GHz	–	-3.8 dBi
19104561	H&S Antenna SOA-2456/360/1/0/V	2 dBi	2.5 dBi
–	H&S Antenna SWA-2459/360/4/45/V	4 dBi	7.5 dBi

Caution: Changes or modifications not expressively approved by SEW-EURODRIVE void the user`s authority to operate the equipment.

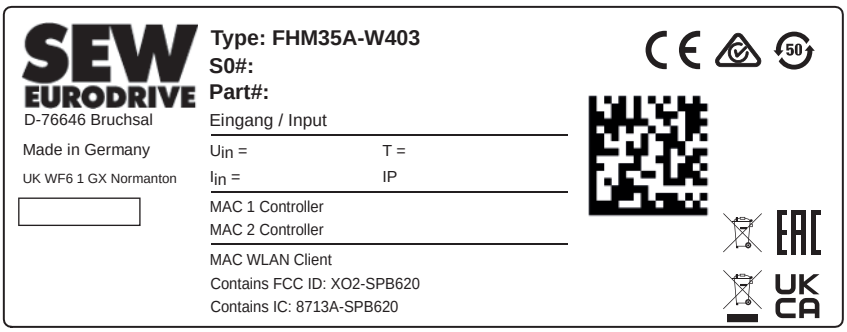
Canada

The following statements and conformity assumptions under ISED Canada rules are only applicable for the following equipment:

- FHM35A-W403, part number 28317394

The label identification is as follows:

- Contains IC: 8713A-SPB620



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This device complies with ISED Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1. this device may not cause interference, and
2. this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

3. l'appareil ne doit pas produire de brouillage, et

31989055/EN – 05/2025

4. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Exposure Requirements

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps

The equipment is approved with the following antennas only:

Antenna:

The end-user product will be professionally installed in such a manner that only the authorized antennas are used:

Part number	Type	Gain 2.4 GHz	Gain 5 GHz
13003356	Coupler leaky-wave R-SMA 2.4 GHz	2.7 dBi	–
18231942	Coupler leaky-wave R-SMA 5 GHz	–	4.6 dBi
18244327	Coupler waveguide R-SMA 2.4 GHz	2.4 dBi	–
18235840	Coupler waveguide R-SMA 5 GHz	–	-3.8 dBi
19104561	H&S Antenna SOA-2456/360/1/0/V	2 dBi	2.5 dBi
–	H&S Antenna SWA-2459/360/4/45/V	4 dBi	7.5 dBi

31989055/EN – 05/2025

China

编号：2024-17901
Certificate No.

无线电发射设备型号核准证

Radio Transmission Equipment Type Approval Certificate

德国 SEW-EURODRIVE Verwaltungs-GmbH：

根据《中华人民共和国无线电管理条例》，经审查，下列设备准予颁发无线电发射设备型号核准证。

In accordance with the Radio Regulations of the People's Republic of China, after examination, the Radio Transmission Equipment Type Approval Certificate is granted to the following equipment.

设备名称： Equipment Name	5.8GHz/5.1GHz/2.4GHz无线局域网设备
设备型号： Equipment Type	FHM35A
核准代码： CMIIT ID	24J996C9B045
主要功能： Main Functions	数据传输
有效期： Validity	五年

其他事项载于附页。
Additional Items as Seen in Attachments.

中华人民共和国工业和信息化部 发证机关
Sealed by Issuing Authority
2024 年 09 月 29 日
Year Month Date

中华人民共和国工业和信息化部统一制作
Issued by the Ministry of Industry and Information Technology of the People's Republic of China

无线电发射设备型号核准证

Radio Transmission Equipment Type Approval Certificate

附页一

Attachment1

设备型号(Equipment Type): FHM35A

核准代码(CMIIT ID): 24J996C9B045

技术体制/射频模块 Technical Scheme/ RF Module	工作频率范围 Operating Frequency Range	调制方式 Modulation Mode	频率容限 Frequency Tolerance	占用带宽 Occupied Bandwidth	发射功率限值 Transmitting Power Limits	杂散发射限值 Spurious Emission Limits
无线局域网	5725-5850MHz 5150-5350MHz 2400-2483.5MHz	BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM/DBPSK/DQPSK/CCK	≤20ppm	≤80MHz ≤80MHz ≤40MHz	≤33dBm(EIRP) ≤20/23dBm(EIRP) (不支持TPC) ≤20dBm(EIRP)	≤-30dBm

备注（Notes）：

审核机构
Sealed by Approving Agency
2024年09月29日
Year Month Date

第 1 页 共 1 页

31989055/EN – 05/2025

无线电发射设备型号核准证

Radio Transmission Equipment Type Approval Certificate

附页二

Attachment2

设备型号(Equipment Type): FHM35A　　核准代码(CMIIT ID): 24J996C9B045

序号 No.	生产企业单位名称 Factory	是否为代工企业 OEM or not	地址 Address
1	SEW-EURODRIVE Verwaltungs-GmbH	否	Ernst-Blickle-Str. 42, 76646 Bruchsal, Germany

特别规定事项

Specific Requirement(s)

根据无线电管理相关技术要求更新情况，须保证产品持续符合无线电管理的相关要求。该设备符合工信部无【2021】129号要求。

使用要求

General Requirements

1.生产或者进口在国内销售、使用的无线电发射设备，应当符合产品质量等法律法规、国家标准和国家无线电管理的有关规定。

1.Radio transmission equipment produced or imported for domestic sales and uses shall comply with the laws, regulations and national standards on product quality, and relevant provisions of national radio regulations.

2.生产或者进口在国内销售、使用的无线电发射设备技术参数与型号核准证核定的指标相一致。

2.The technical parameters of the radio transmission equipment produced or imported for domestic sales and uses shall comply with the Type Approval Certificate.

3.型号核准证有效期届满需要延续的、型号核准证需要变更的，应当依据有关规定向国家无线电管理机构提出申请。

3.If the Type Approval Certificate expires and needs to be extended or changed, an application shall be submitted to the state radio regulatory agency in accordance with relevant regulations.

4.生产、进口、销售和维修无线电发射设备应接受无线电管理机构的监督检查。

4.The production, import, sales, and maintenance of radio transmission equipment shall be subject to supervision and inspection by the radio regulatory agencies.

审核机构

Sealed by Approving Agency

2024年09月29日

Year Month Date

第 1 页 共 1 页

9.5.5 Markings

INFORMATION

The device may not be operated outside the preset regulatory domain.

Country-specific markings for approved regulatory domains are attached to the device.

9.6 Ports and services for Ethernet-based communication

9.6.1 Access via Ethernet-based interfaces

Access via Ethernet service interface

The Ethernet service interface is active in the factory settings.

Service/function	Port	Protocol	Factory setting	Authentication	Operation	Engineering	Authorization/ description
SSH/SFTP	22	TCP	Can be activat- ed	Yes	No	Yes	Read and write
CoAP Multicast	5683	UDP	Active	No	Yes	Yes	Identification tag
CoAPs	5684	UDP	Active	Yes	Yes	Yes	Read and write

Access via Ethernet service interface

The Ethernet fieldbus interface is deactivated in the factory settings.

If you activate the interface, the ports and services are set as follows by default:

Service/function	Port	Protocol	Factory setting	Authentication	Operation	Engineering	Authorization/ description
SSH/SFTP	22	TCP	Can be activat- ed	Yes	No	Yes	Read and write
CoAP Multicast	5683	UDP	Active	No	Yes	Yes	Identification tag
CoAPs	5684	UDP	Active	Yes	Yes	Yes	Read and write

Access via system bus SBusPLUS interface

The SBus^{PLUS} interface is deactivated in the factory settings.

If you activate the interface, the ports and services are set as follows by default:

31989055/EN – 05/2025

Service/function	Port	Protocol	Factory setting	Authentication	Operation	Engineering	Authorization/ description
SSH/SFTP	22	TCP	Can be activat-ed	Yes	No	Yes	Read and write
CoAP Multicast	5683	UDP	Active	No	Yes	Yes	Identification tag
CoAPs	5684	UDP	Active	Yes	Yes	Yes	Read and write

9.6.2 Access via Wi-Fi interface

Access via the Wi-Fi interface is deactivated in the factory settings.

If you activate the interface, the ports and services are set as follows by default:

Service/function	Port	Protocol	Factory setting	Authentication	Operation	Engineering	Authorization/ description
SSH/SFTP	22	TCP	Can be activat-ed	Yes	No	Yes	Read and write
CoAP Multicast	5683	UDP	Active	No	Yes	Yes	Identification tag
CoAPs	5684	UDP	Active	Yes	Yes	Yes	Read and write

31989055/EN – 05/2025

9.7 Open source software components

This product contains software components that have been licensed by the copyright holders under a free or open source software license. These licenses require the provision of the source code. The source code for these software components is not included in the scope of delivery.

To obtain the source code for these software components on a data carrier (CD-ROM, DVD or USB memory stick), send a written request to the address below or via e-mail to opensource@SEW-EURODRIVE.de.

SEW-EURODRIVE GmbH & Co KG
Softwareentwicklung IIoT
Ernst-Blickle-Str. 42
76646 Bruchsal, Germany

Please provide the following information:

- Address to which the source code is to be sent
- Information on the unambiguous identification of the product (e.g. specific product name, serial number)

The source code will be delivered to the specified address after the actual costs incurred for the provision of the data carrier and for shipping have been reimbursed.

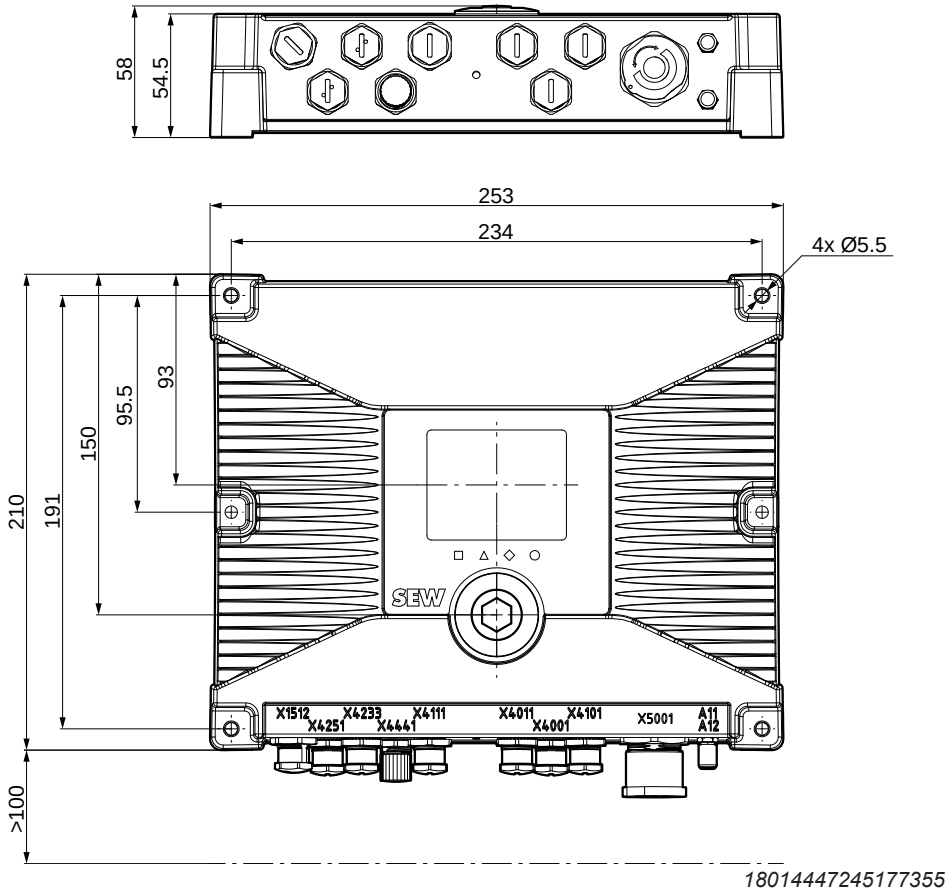
This quotation is valid for the following period:

- 3 years from the date on which the product with the object code of the desired component was last distributed by SEW-EURODRIVE.
- For source code under the GPL 3.0 license: For as long as SEW-EURODRIVE offers spare parts or customer support for this product.

31989055/EN – 05/2025

9.8 Dimension drawing

The dimension drawing shows the mechanical dimensions in mm:



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The recommended minimum clearance for connection cables and plug connectors in the dimension drawing can vary depending on the cables used.

31989055/EN – 05/2025

10 Contacting SEW-EURODRIVE

You can find the worldwide contact data and locations on the **SEW-EURODRIVE website** via the following link or the QR code shown below.

https://www.sew-eurodrive.de/contacts-worldwide

31989055/EN – 05/2025

Index

31989055/EN – 05/25

31989055/EN – 05/25

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Fax +49 7251 75-1970
sew@sew-eurodrive.com
→ www.sew-eurodrive.com