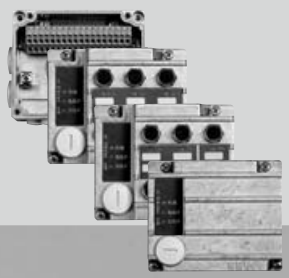
SEW EURODRIVE

Drive System for Decentralized Installation
DeviceNet/CANopen Interfaces, Field Distributors

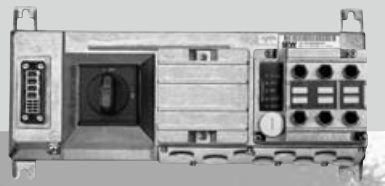
Edition

04/2003



DeviceNet™ CONFORMANCE TESTED

CANopen



Manual

10564918 / EN

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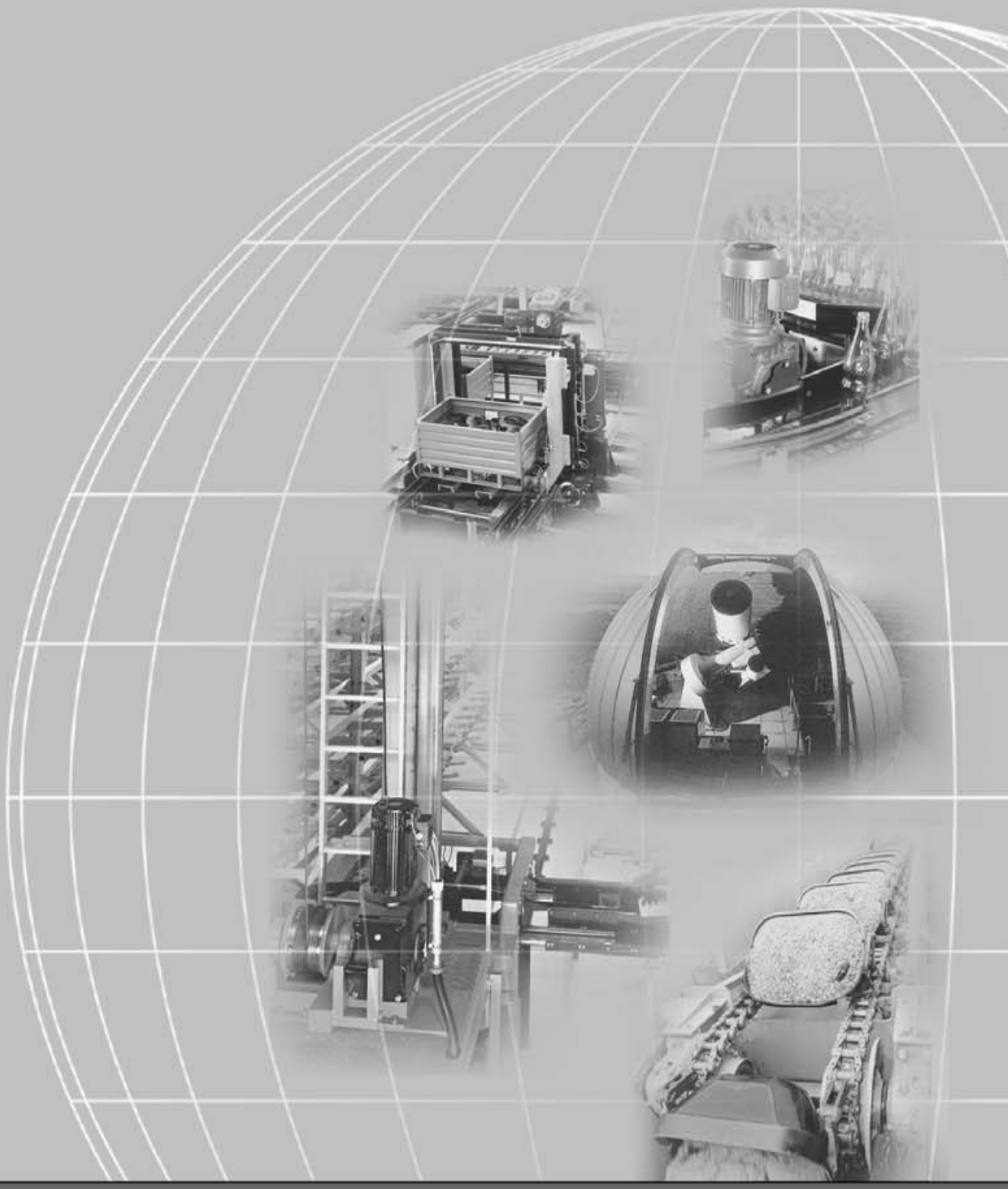


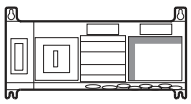
SEW-EURODRIVE

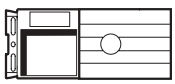
1 Valid Components

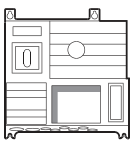
This manual applies to the following products:

..Z.1. connection module with fieldbus interface			
	**4 x I / 2 x O (terminals)** 	**4 x I / 2 x O (M12)** 	**6 x I (M12)** 
DeviceNet fieldbus module	MFD 21A / Z31A	MFD 22A / Z31A	MFD 32A / Z31A
Intelligent DeviceNet fieldbus module	MQD 21A / Z31A	MQD 22A / Z31A	MQD 32A / Z31A
CANopen fieldbus module	MFO 21A / Z31A	MFO 22A / Z31A	MFO 32A / Z31A

..Z.3. field distributor with fieldbus interface			
	**4 x I / 2 x O (terminals)** 	**4 x I / 2 x O (M12)** 	**6 x I (M12)** 
DeviceNet fieldbus module	MFD 21A / Z33A	MFD 22A / Z33A	MFD 32A / Z33A
Intelligent DeviceNet fieldbus module	MQD 21A / Z33A	MQD 22A / Z33A	MQD 32A / Z33A
CANopen fieldbus module	MFO 21A / Z33A	MFO 22A / Z33A	MFO 32A / Z33A

..Z.6. field distributor with fieldbus interface			
	**4 x I / 2 x O (terminals)** 	**4 x I / 2 x O (M12)** 	**6 x I (M12)** 
DeviceNet fieldbus module	MFD 21A / Z36F / AF1	MFD 22A / Z36F / AF1	MFD 32A / Z36F / AF1
Intelligent DeviceNet fieldbus module	MQD 21A / Z36F / AF1	MQD 22A / Z36F / AF1	MQD 32A / Z36F / AF1
CANopen fieldbus module	MFO 21A / Z36F / AF1	MFO 22A / Z36F / AF1	MFO 32A / Z36F / AF1

..Z.7. field distributor with fieldbus interface			
	**4 x I / 2 x O (terminals)** 	**4 x I / 2 x O (M12)** 	**6 x I (M12)** 
DeviceNet fieldbus module	MFD21A/MM../Z37F.	MFD22A/MM../Z37F.	MFD32A/MM../Z37F.
Intelligent DeviceNet fieldbus module	MQD21A/MM../Z37F.	MQD22A/MM../Z37F.	MQD32A/MM../Z37F.
CANopen fieldbus module	MFO21A/MM../Z37F.	MFO22A/MM../Z37F.	MFO32A/MM../Z37F.

..Z.8. field distributor with fieldbus interface			
	**4 x I / 2 x O (terminals)** 	**4 x I / 2 x O (M12)** 	**6 x I (M12)** 
DeviceNet fieldbus module	MFD21A/MM../Z38F./AF1	MFD22A/MM../Z38F./AF1	MFD32A/MM../Z38F./AF1
Intelligent DeviceNet fieldbus module	MQD21A/MM../Z38F./AF1	MQD22A/MM../Z38F./AF1	MQD32A/MM../Z38F./AF1
CANopen fieldbus module	MFO21A/MM../Z38F./AF1	MFO22A/MM../Z38F./AF1	MFO32A/MM../Z38F./AF1

2 Important Notes

Safety and warning instructions

Always follow the safety and warning instructions contained in this publication!

Electrical hazard
Possible consequences: Severe or fatal injuries.

Hazard
Possible consequences: Severe or fatal injuries.

Hazardous situation
Possible consequences: Slight or minor injuries.

Harmful situation
Possible consequences: Damage to the unit and the environment.

Tips and useful information.

Other applicable documents

- Operating Instructions "MOVIMOT® MM03C to MM3XC"
- Operating Instructions "DR/DT/DV AC Motors, CT/CV Asynchronous Servomotors"
- **If MOVIMOT® is used for emergency stops, the supplemental documentation "Safe Disconnection for MOVIMOT®" must be observed. Only those components may be used in safety applications that were explicitly delivered with this design by SEW-EURODRIVE!**

Intended usage

- These MOVIMOT® drives are intended for industrial systems. They comply with the applicable standards and regulations and meet the requirements of the Low Voltage Directive 73/23/EEC.
- The use of MOVIMOT® for hoist applications is limited!
- Technical data and information about the permitted conditions where the unit is used can be found on the nameplate and in these operating instructions.
- It is essential to observe this specified information!
- Do not start up the unit (take it into operation in the designated fashion) until you have established that the machine complies with the EMC Directive 89/336/EEC and that the conformity of the end product has been determined in accordance with the Machinery Directive 89/392/EEC (with reference to EN 60204).

Application environment

The following uses are forbidden unless measures are expressly taken to make them possible:

- Use in explosion-proof areas
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in non-stationary applications which are subject to mechanical vibration and shock loads in excess of the requirements in EN 50178
- Use in applications in which the MOVIMOT® inverter undertakes independent safety functions (without master safety systems) to ensure the safety of machines and personnel

Waste disposal

This product consists of:

- Iron
- Aluminum
- Copper
- Plastic
- Electronic components

Dispose of all components in accordance with applicable regulations!

3 Safety Notes

3.1 Safety notes for MOVIMOT® drives

- Never install damaged products or take them into operation. Please submit a complaint to the shipping company immediately in the event of a damage.
- Only specialists with the appropriate accident prevention training are allowed to perform installation, startup and service work. These specialist must also comply with the regulations in force (e.g. EN 60204, VBG 4, DIN-VDE 0100/0113/0160) when performing this work.
- Preventive measures and protection devices must correspond to the regulations in force (e.g. EN 60204 or EN 50178).

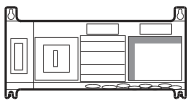
  Necessary protective measures: Grounding of the MOVIMOT® unit and the field distributor.
- The unit meets all requirements for safe isolation of power and electronic connections in accordance with EN 50178. All connected circuits must also satisfy the requirements for safe disconnection.
- Before removing the MOVIMOT® inverter, it must be disconnected from the power supply system. Dangerous voltages may still be present for up to one minute after disconnection from the power supply source.
- As soon as supply voltage is present at the MOVIMOT® unit or field distributor, close the terminal box or field distributor and install the MOVIMOT® inverter.
- The fact that the status LED and other display elements are no longer illuminated does not indicate that the unit has been disconnected from the power supply and no longer carries any voltage.
- Mechanical blocking or internal safety functions of the unit can cause a motor standstill. Removing the cause of this problem or performing a reset can result in the motor re-starting on its own. If, for safety reasons, this is not permitted for the driven machine, the MOVIMOT® inverter must be disconnected from the power supply before correcting the problem.
- Danger of burns: The surface temperature of the MOVIMOT® inverter (especially of the heat sink) can exceed 60 °C during operation!
- If MOVIMOT® or field distributors are used in safe applications, you must observe the supplemental documentation "Safe Disconnection for MOVIMOT®". Use only those components in safety applications that were explicitly delivered in this design by SEW-EURODRIVE!

3.2 Additional safety instructions for field distributors

MFZ.3.

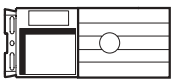
- Disconnect the unit from the power supply system before removing the bus module or the motor plug. Dangerous voltages may still be present for up to one minute after disconnection from the power supply source.
- The bus module and the plug of the hybrid cable must be connected to the field distributor and fastened during operation.

MFZ.6.



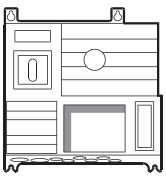
- Disconnect the unit from the power supply system before removing the terminal box cover for connection to the power supply system. Dangerous voltages may still be present for up to one minute after disconnection from the power supply source.
- Important: The switch only disconnects the MOVIMOT® unit from the power supply system. The terminals of the field distributor are still connected to the power supply system after operating the maintenance switch.
- The cover on that part of the terminal box housing the connection to the power supply must be closed; the plug of the hybrid cable must be connected to the field distributor and fastened during operation.

MFZ.7.



- Before removing the MOVIMOT® inverter, it must be disconnected from the power supply system. Dangerous voltages may still be present for up to one minute after disconnection from the power supply source.
- The MOVIMOT® inverter and the plug of the hybrid cable must be connected to the field distributor and fastened during operation.

MFZ.8.

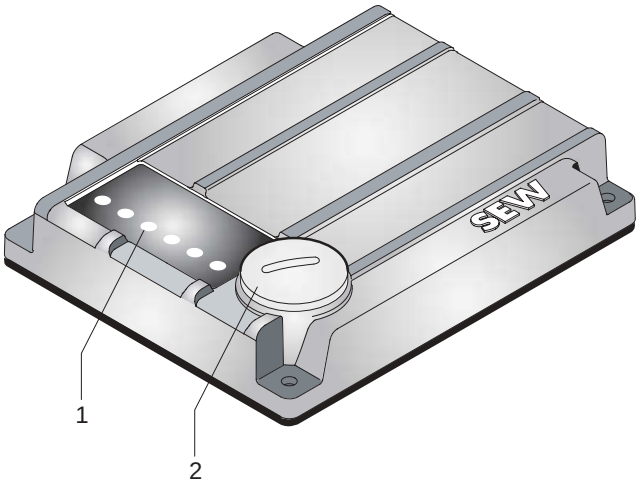


- Disconnect the unit from the power supply system before removing the terminal box cover for the power supply connection or the MOVIMOT® inverter. Dangerous voltages may still be present for up to one minute after disconnection from the power supply source.
- Important: The maintenance switch only disconnects the connected motor from the power supply system. The terminals of the field distributor remain connected to the power supply system even after operation of the maintenance switch.
- The terminal box cover for the power supply connection, the MOVIMOT<:cs "Prodname" 1>® inverter and the plug of the hybrid cable must be connected to the field distributor and fastened during operation.®

4 Unit Design

4.1 Fieldbus interfaces

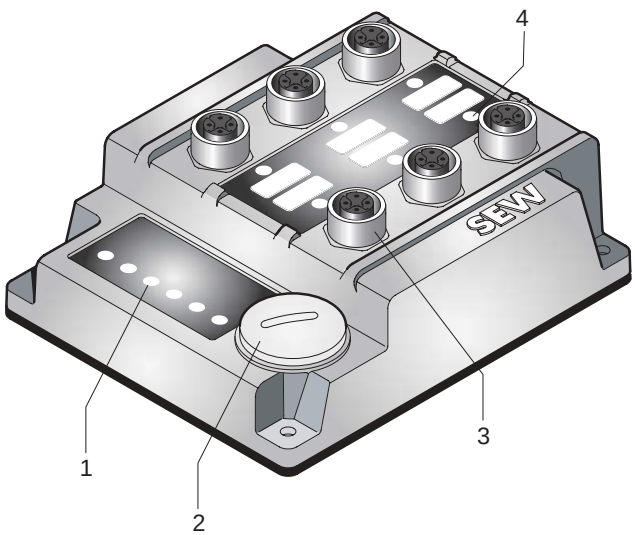
MF.21/MQ.21 fieldbus interfaces



50353AXX

1 Diagnostic LEDs
2 Diagnostics interface (below the screw plug)

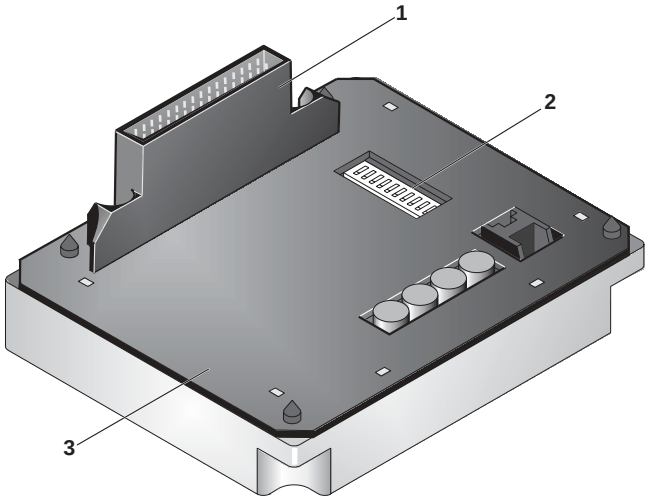
MF.22, MF.32, MQ.22, MQ.32 fieldbus interfaces



50352AXX

1 Diagnostic LEDs
2 Diagnostics interface (below the screw plug)
3 M12 connection sockets
4 Status LED

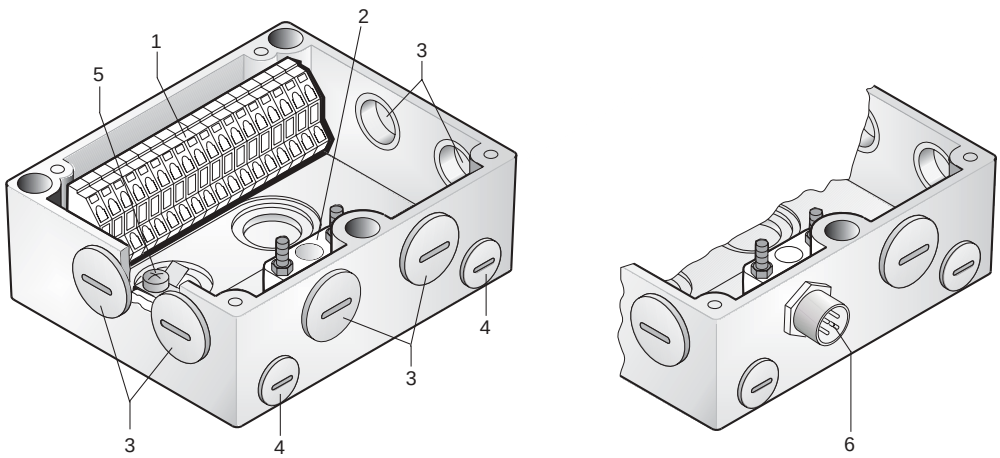
Bottom of module (all MF../MQ.. variants)



01802CDE

1 Connection to connection module
2 DIP switches (depend on variant)
3 Gasket

Unit design of MFZ connection module



06169AXX

1 Terminal strip (X20)
2 Insulated terminal block for 24 V through-wiring
(Caution! Do not use for shielding!)
3 Cable gland M20
4 Cable gland M12
5 Grounding terminal
6 For DeviceNet and CANopen: Micro-style connector/M12 connector (X11)
For AS interface: AS-i M12 connector (X11)

The scope of delivery includes two EMC cable glands.

4.2 Type designation of DeviceNet interfaces

MFD 21 A / Z31 A

Design

Connection module:
Z11 = for InterBus
Z21 = for PROFIBUS
Z31 = for DeviceNet and CANopen
Z61 = for AS-i

Design

21 = 4 x I / 2 x O (connection via terminals)
22 = 4 x I / 2 x O (connection via plug connector + terminals)
32 = 6 x I (connection via plug connector + terminals)

23 = 4 x I / 2 x O (FO rugged line, for InterBus only)
33 = 6 x I (FO rugged line, for InterBus only)

MFI.. = InterBus
MQI.. = Intelligent InterBus fieldbus module
MFP.. = PROFIBUS
MQP.. = Intelligent PROFIBUS fieldbus module
MFD.. = DeviceNet
MQD.. = Intelligent DeviceNet fieldbus module
MFO.. = CANopen
MFK.. = AS-i

4.3 Type designation of CANopen interfaces

MFO 21 A / Z31 A

Design

Connection module:
Z11 = for InterBus
Z21 = for PROFIBUS
Z31 = for DeviceNet and CANopen
Z61 = for AS-i

Design

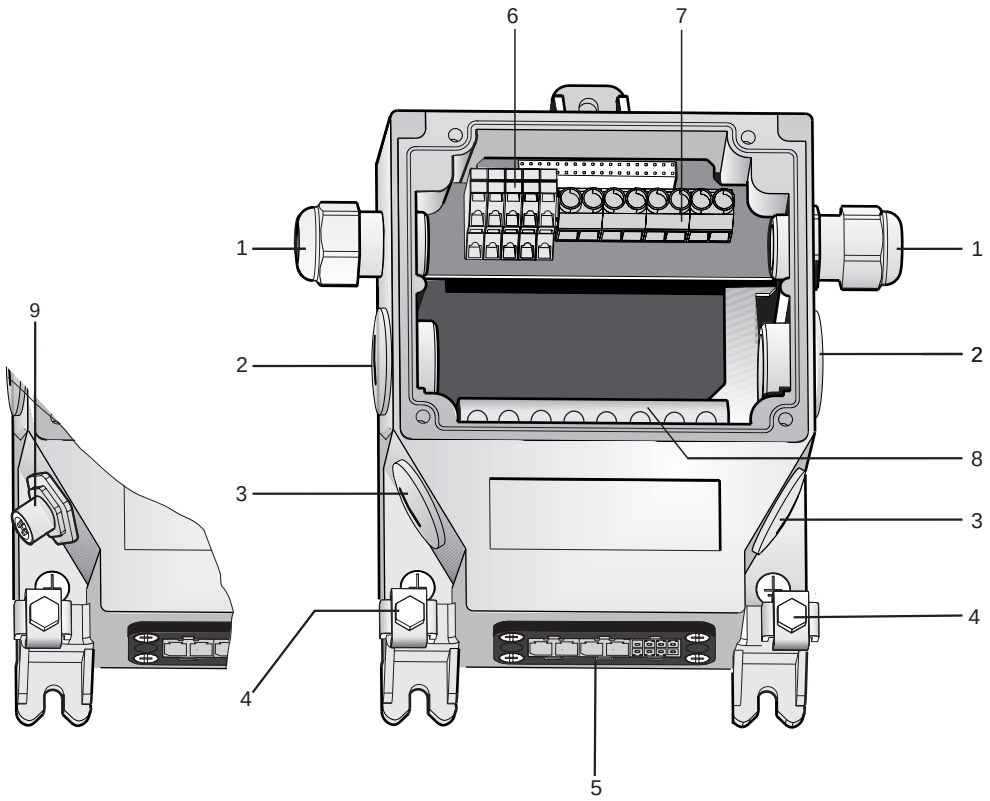
21 = 4 x I / 2 x O (connection via terminals)
22 = 4 x I / 2 x O (connection via plug connector + terminals)
32 = 6 x I (connection via plug connector + terminals)

23 = 4 x I / 2 x O (FO rugged line, for InterBus only)
33 = 6 x I (FO rugged line, for InterBus only)

MFI.. = InterBus
MQI.. = Intelligent InterBus fieldbus module
MFP.. = PROFIBUS
MQP.. = Intelligent PROFIBUS fieldbus module
MFD.. = DeviceNet
MQD.. = Intelligent DeviceNet fieldbus module
MFO.. = CANopen
MFK.. = AS-i

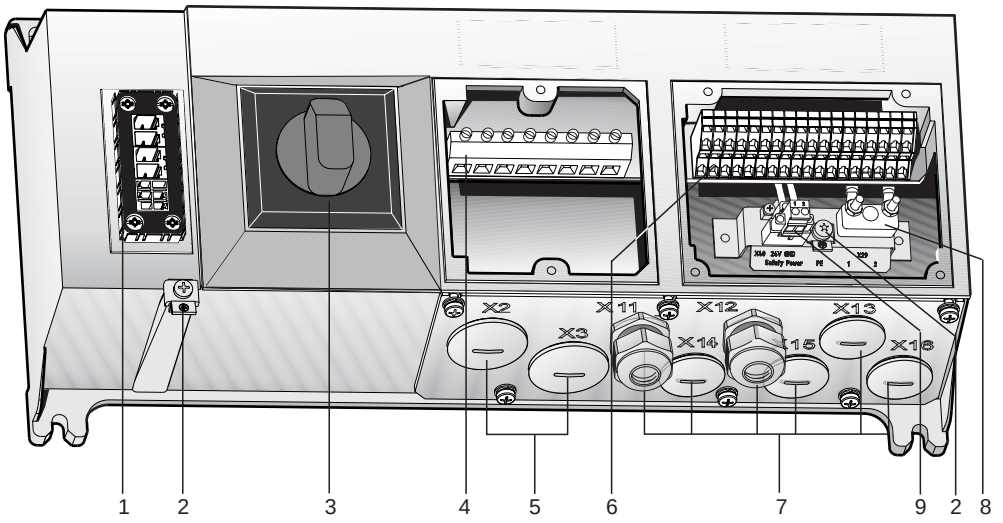
4.4 Field distributors

MF.../Z.3., MQ.../Z.3. field distributors



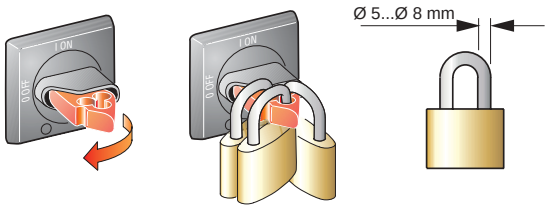
1 2 x M16 x 1.5 (scope of delivery includes two EMC cable glands)
2 2 x M25 x 1.5
3 2 x M20 x 1.5
4 Equipotential bonding connection
5 Connection hybrid cable, connection to MOVIMOT® (X9)
6 Terminals for fieldbus connections (X20)
7 Terminals for 24 V connection (X21)
8 Terminals for power supply system and PE connection (X1)
9 For DeviceNet and CANopen: Micro-style connector/M12 connector (X11)
For AS interface: AS-i M12 connector (X11)

MF.../Z.6., MQ.../Z.6. field distributors



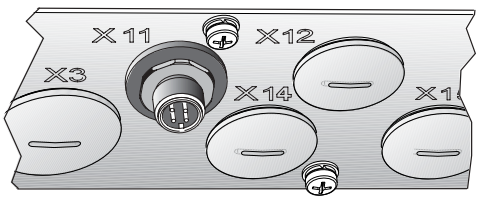
05903AXX

1 Connection hybrid cable, connection to MOVIMOT® (X9)
2 Equipotential bonding connection
3 Maintenance switch **with line protection** (triple lock, color: black/red)



03546AXX

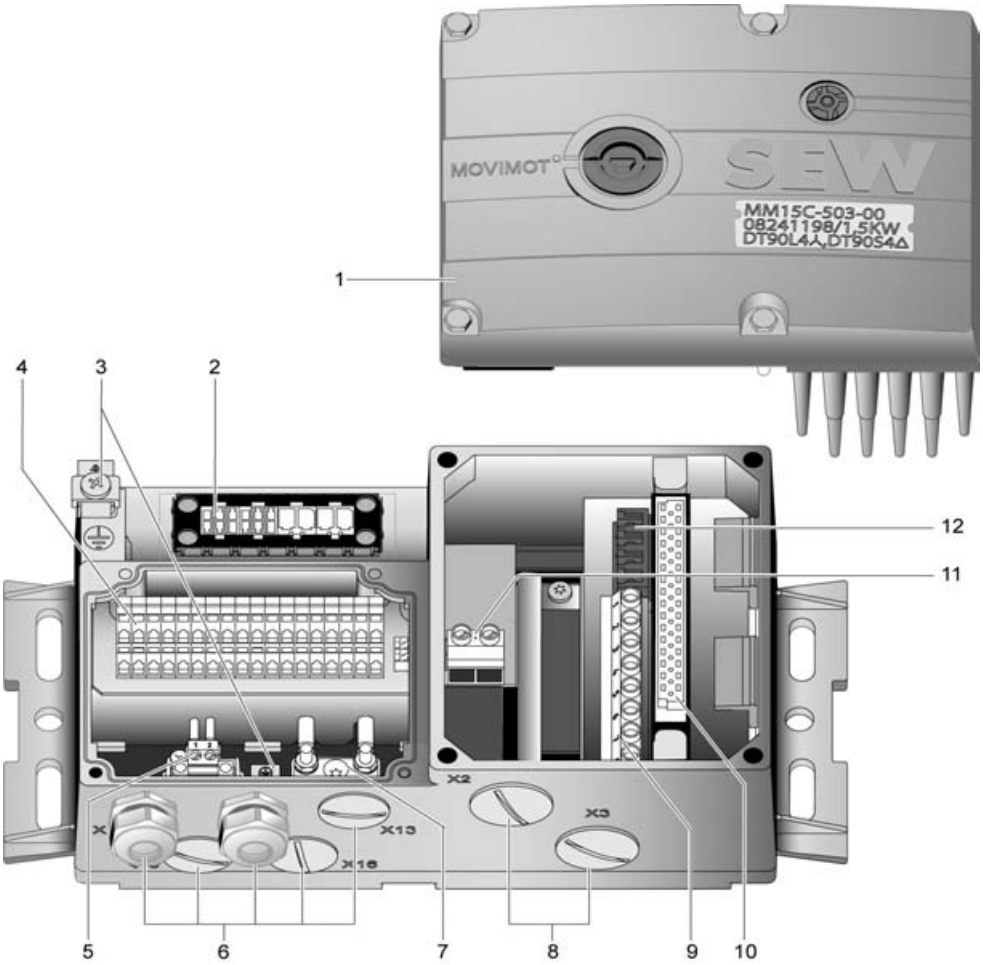
4 Terminals for supply system and PE connection (X1)
5 2 x M25 x 1.5
6 Terminals for bus, sensor, actuator, 24 V connection (X20)
7 6 x M20 x 1.5 (scope of delivery includes two EMC cable glands)
For DeviceNet and CANopen: Micro-style connector/M12 connector (X11), see the following figure
For AS interface: AS-i M12 connector (X11), see the following figure



06115AXX

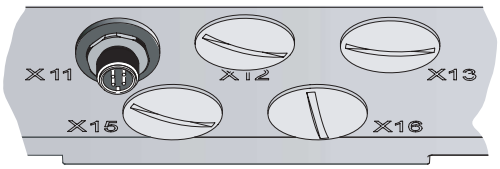
8 Terminal block for 24 V through-wiring (X29), internal connection to 24 V on X20
9 Pluggable terminal "Safety Power" for 24 V MOVIMOT® supply (X40)

MF.../MM../Z.7.,
MQ.../MM../Z.7.
field distributors



51174AXX

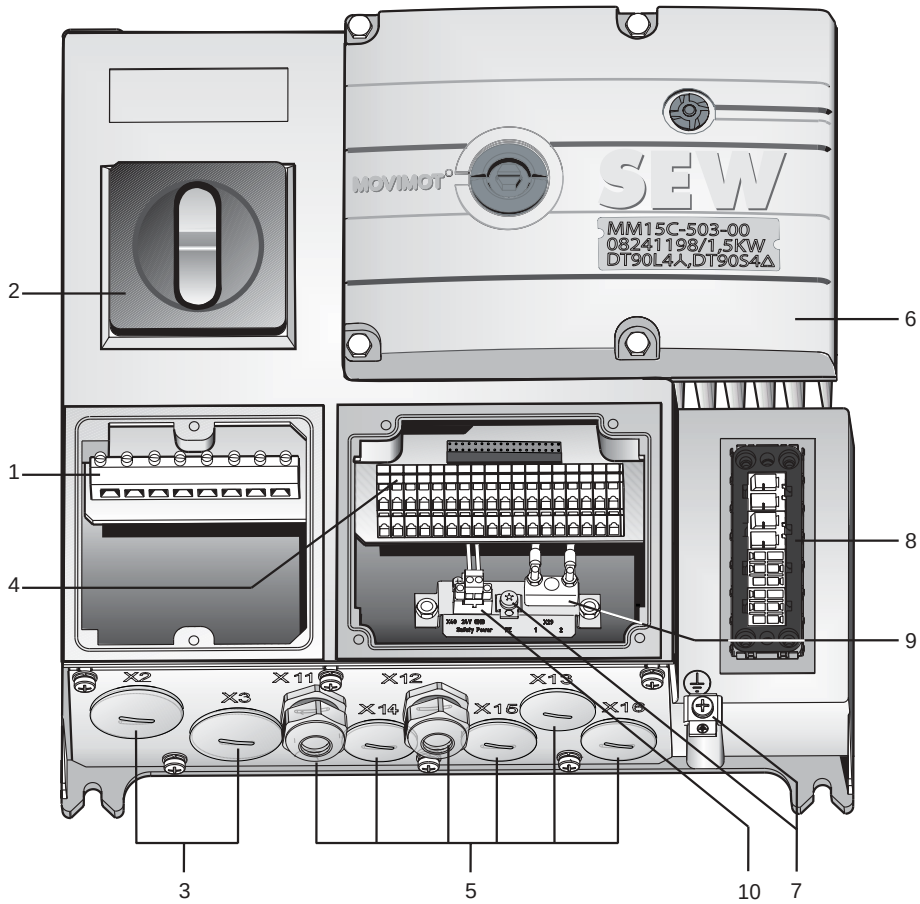
1 MOVIMOT® frequency inverter
2 Connection hybrid cable, connection to AC motor (X9)
3 Equipotential bonding connection
4 Terminals for bus, sensor, actuator, 24 V connection (X20)
5 Pluggable terminal "Safety Power" for 24 V MOVIMOT® supply (X40)
6 5 x M20 x 1.5 cable gland (scope of delivery includes two EMC cable glands)
For DeviceNet and CANopen: Micro-style connector/M12 connector (X11), see the following figure
For AS interface: AS-i M12 connector (X11), see the following figure



51325AXX

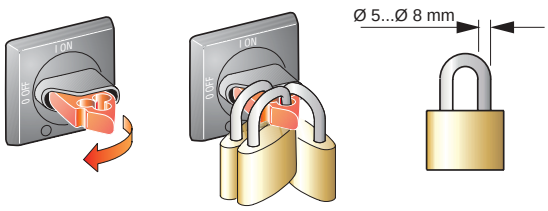
7 Terminal block for 24 V through-wiring (X29), internal connection to 24 V on X20
8 2 x M25 x 1.5 cable screw fittings
9 Terminals for power supply system and PE connection (X1)
10 Connection to frequency inverter
11 Terminal for integrated braking resistor
12 Terminals to enable direction of rotation

MF.../MM../Z.8.,
MQ.../MM../Z.8.
field distributors



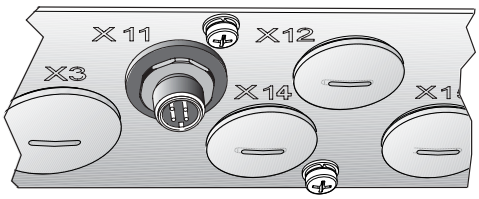
05902AXX

1 Terminals for power supply system and PE connection (X1)
2 Maintenance switch (triple lock, color: black/red)



03546AXX

3 2 x M25 x 1.5 cable screw fittings
4 Terminals for bus, sensor, actuator, 24 V connection (X20)
5 6 x M20 x 1.5 cable gland (scope of delivery includes two EMC cable glands)
For DeviceNet and CANopen: Micro-style connector/M12 connector (X11), see the following figure
For AS interface: AS-i M12 connector (X11), see the following figure



06115AXX

6 MOVIMOT® frequency inverter
7 Equipotential bonding connection
8 Connection hybrid cable, connection to AC motor (X9)
9 Terminal block for 24 V through-wiring (X29), internal connection to 24 V on X20
10 Pluggable terminal "Safety Power" for 24 V MOVIMOT® supply (X40)

4.5 Type designation of DeviceNet field distributors

Example:
MF.../Z.3.,
MQ.../Z.3.

MFD21A/Z33A

Connection module
Z13 = for InterBus
Z23 = for PROFIBUS
Z33 = for DeviceNet and CANopen
Z63 = for AS-i

Fieldbus interface
MFI../MQI.. = InterBus
MFP../MQP.. = PROFIBUS
MFD../MQD.. = DeviceNet
MFO.. = CANopen
MFK.. = AS-i

Example:
MF.../Z6.,
MQ.../Z6.

MFD21A/Z36F/AF1

Connection technology
AF0 = Metric cable entry
AF1 = with micro-style connector/M12 connector DeviceNet and CANopen
AF2 = M12 plug connector for PROFIBUS
AF3 = M12 plug connector for PROFIBUS + M12 plug connector for 24 V_{DC} supply
AF6 = M12 plug connector for AS-i connection

Connection module
Z16 = for InterBus
Z26 = for PROFIBUS
Z36 = for DeviceNet and CANopen
Z66 = for AS-i

Fieldbus interface
MFI../MQI.. = InterBus
MFP../MQP.. = PROFIBUS
MFD../MQD.. = DeviceNet
MFO.. = CANopen
MFK.. = AS-i

Example:
MF.../MM../Z7.,
MQ.../MM../Z7.

MFD22A/MM15C-503-00/Z37F 0

Circuit type
0 = ⅄ / 1= △

Connection module
Z17 = for InterBus
Z27 = for PROFIBUS
Z37 = for DeviceNet and CANopen
Z67 = for AS-i

MOVIMOT® inverter

Fieldbus interface
MFI../MQI.. = InterBus
MFP../MQP.. = PROFIBUS
MFD../MQD.. = DeviceNet
MFO.. = CANopen
MFK.. = AS-i

Example:
MF.../MM../Z.8.,
MQ.../MM../Z.8.

MFD22A/MM22C-503-00/Z38F 0/AF1

Connection technology
AF0 =Metric cable entry
AF1 = with micro-style connector/M12 connector DeviceNet and CANopen
AF2 = M12 plug connector for PROFIBUS
AF3 = M12 plug connector for PROFIBUS + M12 plug connector for 24 V_{DC} supply
AF6 = M12 plug connector for AS-i connection

Circuit type
0 = ⅄ / 1= △

Connection module
Z18 = for InterBus
Z28 = for PROFIBUS
Z38 = for DeviceNet and CANopen
Z68 = for AS-i

MOVIMOT® inverter

Fieldbus interface
MFI../MQI.. = InterBus
MFP../MQP.. = PROFIBUS
MFD../MQD.. = DeviceNet
MFO.. = CANopen
MFK.. = AS-i

4.6 Type designation of CANopen field distributors

Example:
MF.../Z.3.,
MQ.../Z.3.

MFO21A/Z33A

Connection module
Z13 = for InterBus
Z23 = for PROFIBUS
Z33 = for DeviceNet and CANopen
Z63 = for AS-i

Fieldbus interface
MFI../MQI.. = InterBus
MFP../MQP.. = PROFIBUS
MFD../MQD.. = DeviceNet
MFO.. = CANopen
MFK.. = AS-i

Example:
MF.../Z6.,
MQ.../Z6.

MFO21A/Z36F/AF1

Connection technology
AF0 = Metric cable entry
AF1 = with micro-style connector/M12 connector DeviceNet and CANopen
AF2 = M12 plug connector for PROFIBUS
AF3 = M12 plug connector for PROFIBUS + M12 plug connector for 24 V_{DC} supply
AF6 = M12 plug connector for AS-i connection

Connection module
Z16 = for InterBus
Z26 = for PROFIBUS
Z36 = for DeviceNet and CANopen
Z66 = for AS-i

Fieldbus interface
MFI../MQI.. = InterBus
MFP../MQP.. = PROFIBUS
MFD../MQD.. = DeviceNet
MFO.. = CANopen
MFK.. = AS-i

Example:
MF.../MM../Z7.,
MQ.../MM../Z7.

MFO22A/MM15C-503-00/Z37F 0

Circuit type
0 = 人 / 1= △

Connection module
Z17 = for InterBus
Z27 = for PROFIBUS
Z37 = for DeviceNet and CANopen
Z67 = for AS-i

MOVIMOT® inverter

Fieldbus interface
MFI../MQI.. = InterBus
MFP../MQP.. = PROFIBUS
MFD../MQD.. = DeviceNet
MFO.. = CANopen
MFK.. = AS-i

Example:
MF.../MM../Z.8.,
MQ.../MM../Z.8.

MFO22A/MM22C-503-00/Z38F 0/AF1

Connection technology
AF0 = Metric cable entry
AF1 = with micro-style connector/M12 connector DeviceNet and CANopen
AF2 = M12 plug connector for PROFIBUS
AF3 = M12 plug connector for PROFIBUS + M12 plug connector for 24 V_{DC} supply
AF6 = M12 plug connector for AS-i connection

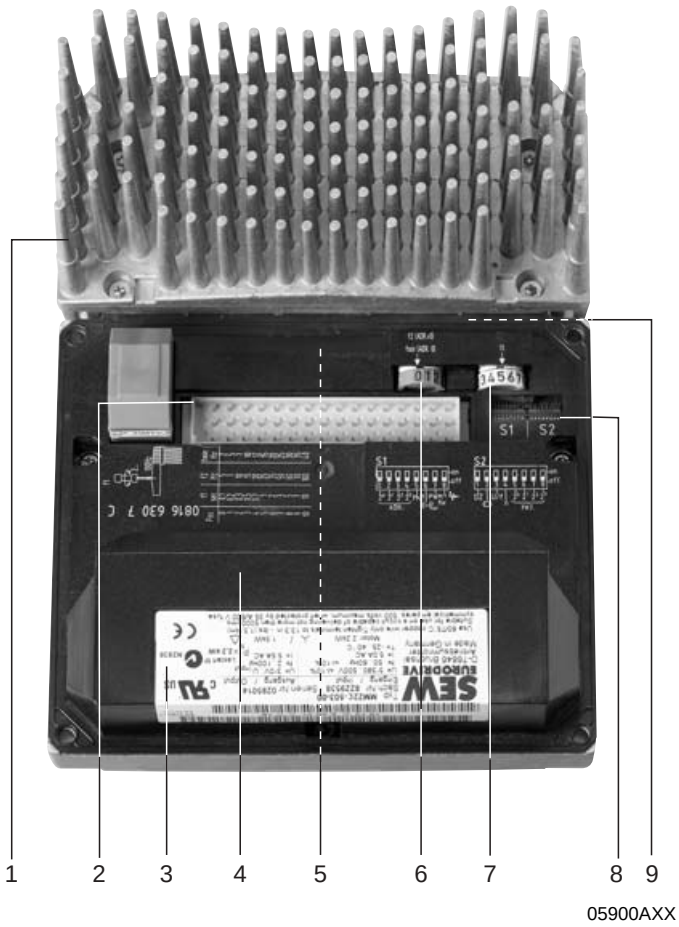
Circuit type
0 = 人 / 1= △

Connection module
Z18 = for InterBus
Z28 = for PROFIBUS
Z38 = for DeviceNet and CANopen
Z68 = for AS-i

MOVIMOT® inverter

Fieldbus interface
MFI../MQI.. = InterBus
MFP../MQP.. = PROFIBUS
MFD../MQD.. = DeviceNet
MFO.. = CANopen
MFK.. = AS-i

4.7 MOVIMOT® frequency inverters (integrated in Z.7/Z.8 field distributors)



1. Heat sink
2. Connection plug between connection unit and inverter
3. Electronics nameplate
4. Safety hood for inverter electronics
5. Setpoint potentiometer f1 (not shown), accessible through a cable gland on top of the terminal box cover
6. Setpoint switch f2 (green)
7. Switch t1 for generator ramp (white)
8. DIP switches S1 and S2 (for settings see the section "Startup")
9. Status LED (visible from the top of the terminal box cover, see the section "Diagnostics")

5 Mechanical Installation

5.1 Installation instructions

In the delivery state of field distributors, the plug connector of the outgoing motor circuit (hybrid cable) is equipped with a transportation protection.

This protection only ensures enclosure IP 40. To obtain the specified enclosure type, remove the transportation protection, install and fasten the appropriate mating connector.

Installation

- Install fieldbus interfaces and field distributors on a level, vibration-proof and torsionally rigid support structure.
- Use M5 screws and suitable washers for installation of the **MFZ.3** field distributor. Tighten the screws with a torque wrench (permitted tightening torque 2.8 to 3.1 Nm).
- Use M6 screws and suitable washers for installation of the **MFZ.6, MFZ.7** or **MFZ.8** field distributor. Tighten the screws with a torque wrench (permitted tightening torque 3.1 to 3.5 Nm).

Installation in damp areas or in the open

- Use suitable cable glands (use reducing adapters if necessary).
- Cover open cable entries and M12 connection sockets with screw plugs.
- Route the cable with a drip loop if the cable entry is located on the side.
- Check the sealing surfaces before reassembling the bus module / terminal box cover. Clean the sealing surfaces, if necessary.

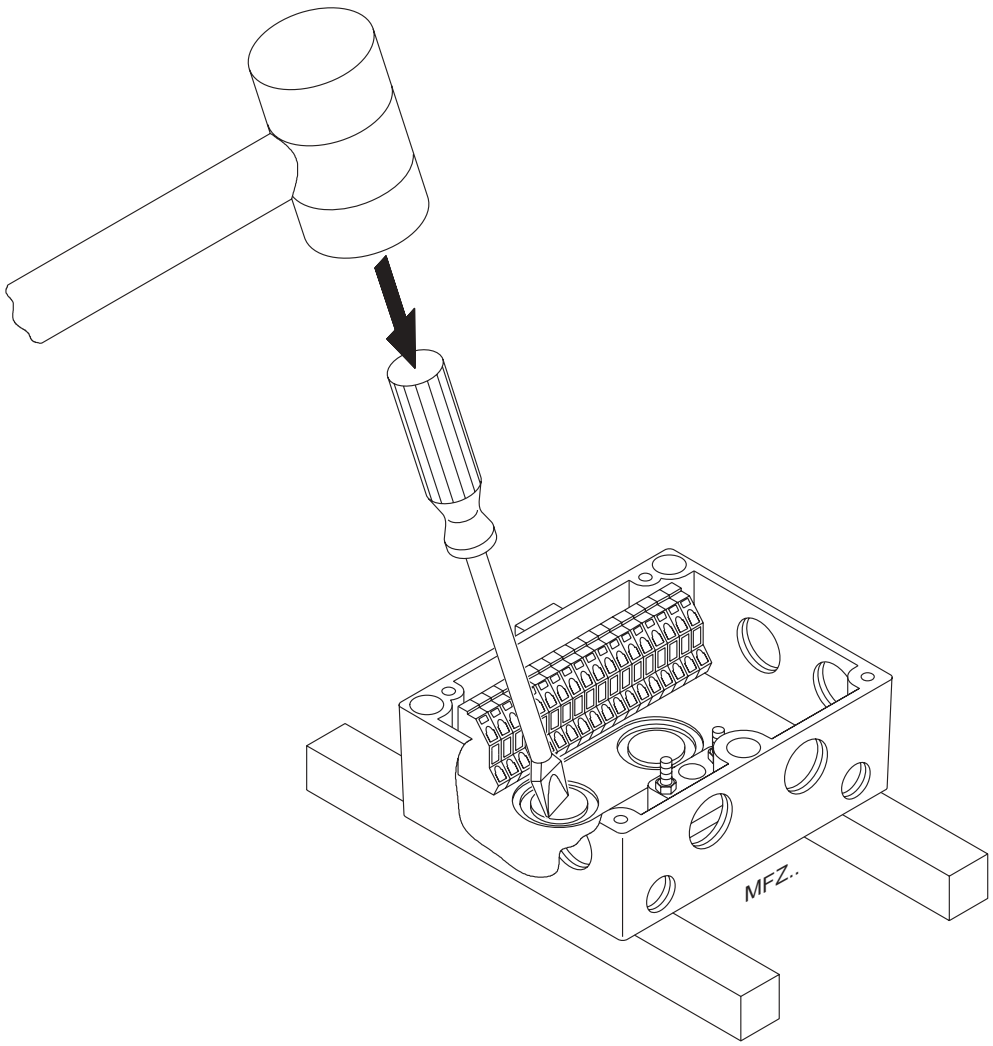
5.2 MF../MQ.. fieldbus interfaces

The MF../MQ.. fieldbus interfaces can be assembled as follows:

- Installation on MOVIMOT® terminal box
- Installation in the field

Installation on MOVIMOT® terminal box

1. Remove knock-outs on MFZ bottom from the inside as illustrated in the following figure:



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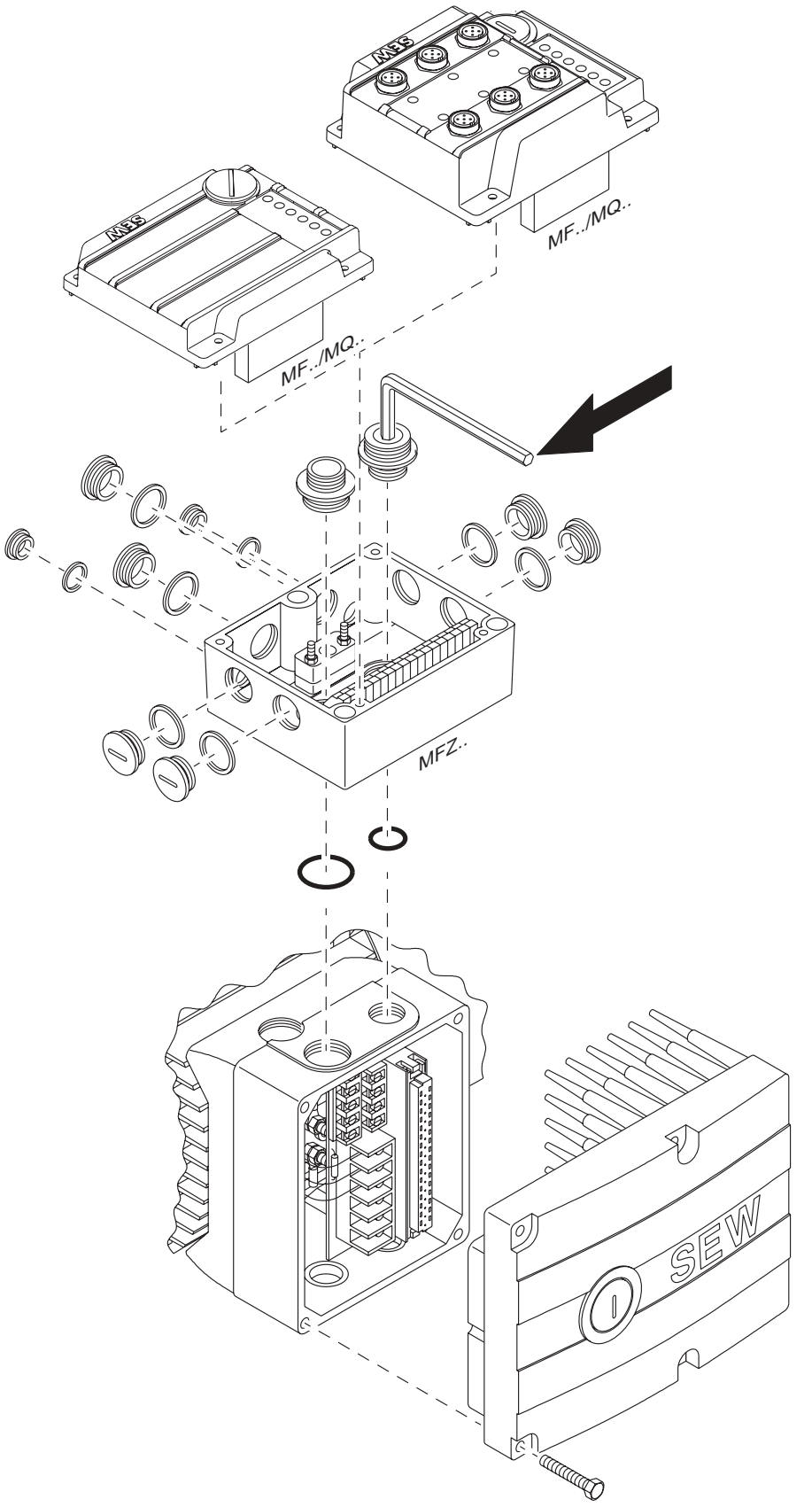
2. Install the fieldbus interface to the MOVIMOT® terminal box according to the following figure:



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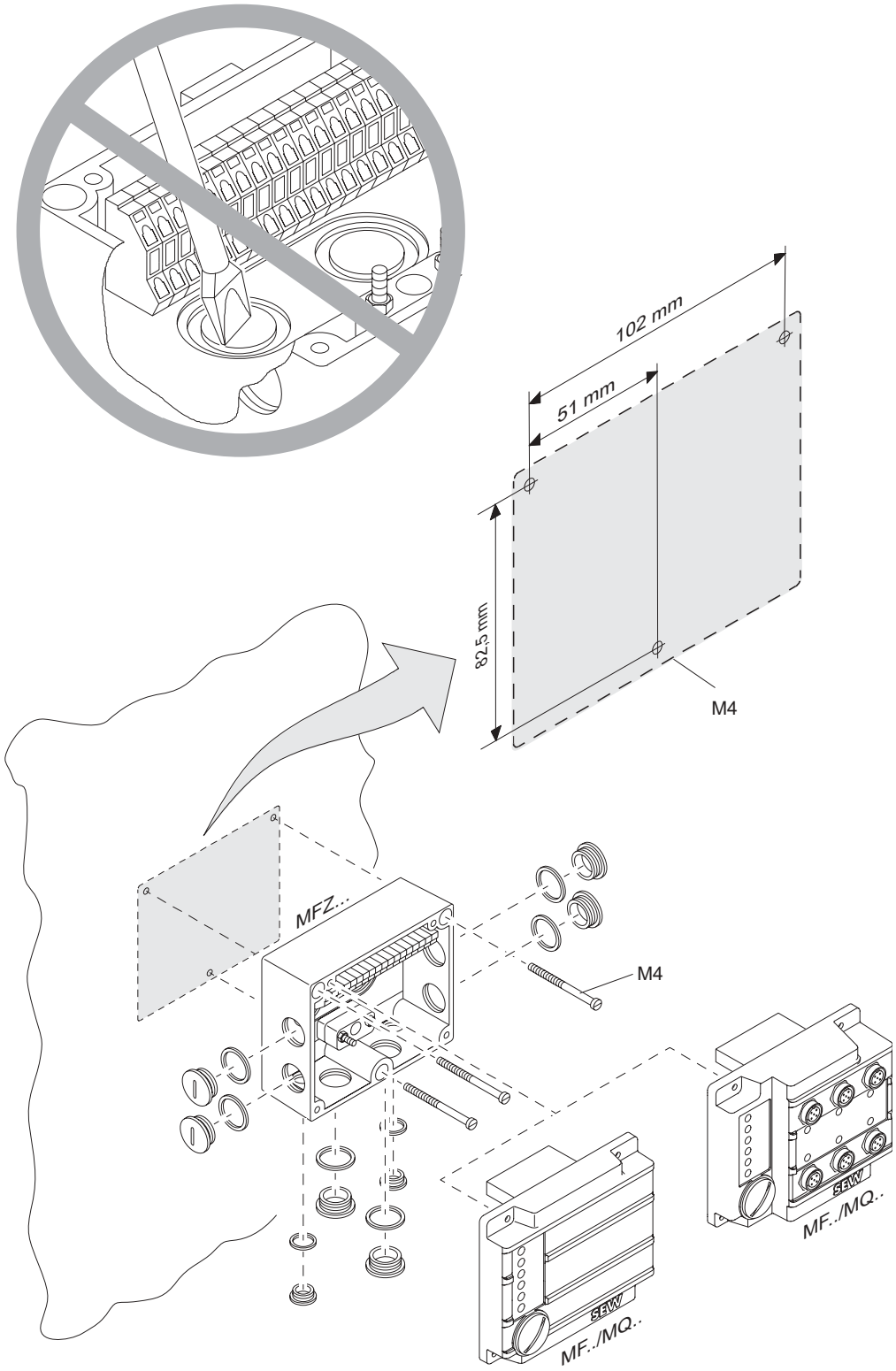
Installation in the field

The following figure shows the installation of an MF../MQ.. fieldbus interface in the field:



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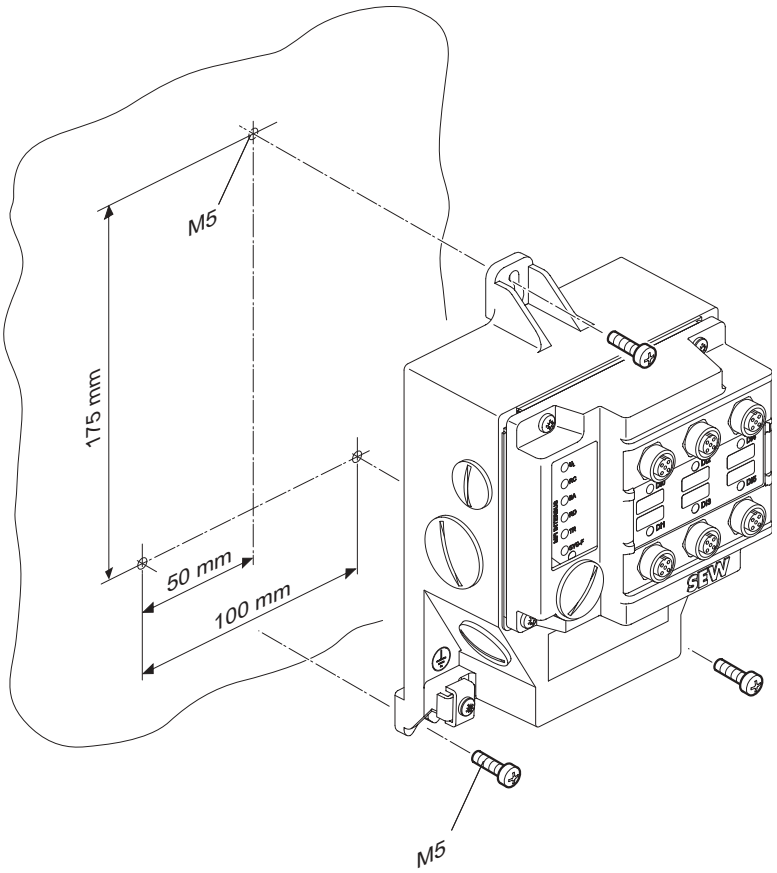
5.3 Field distributors

Installation of MF.../Z.3., MQ.../Z.3. field distributors

The following figure shows the mounting dimensions of the ..Z.3. field distributors:



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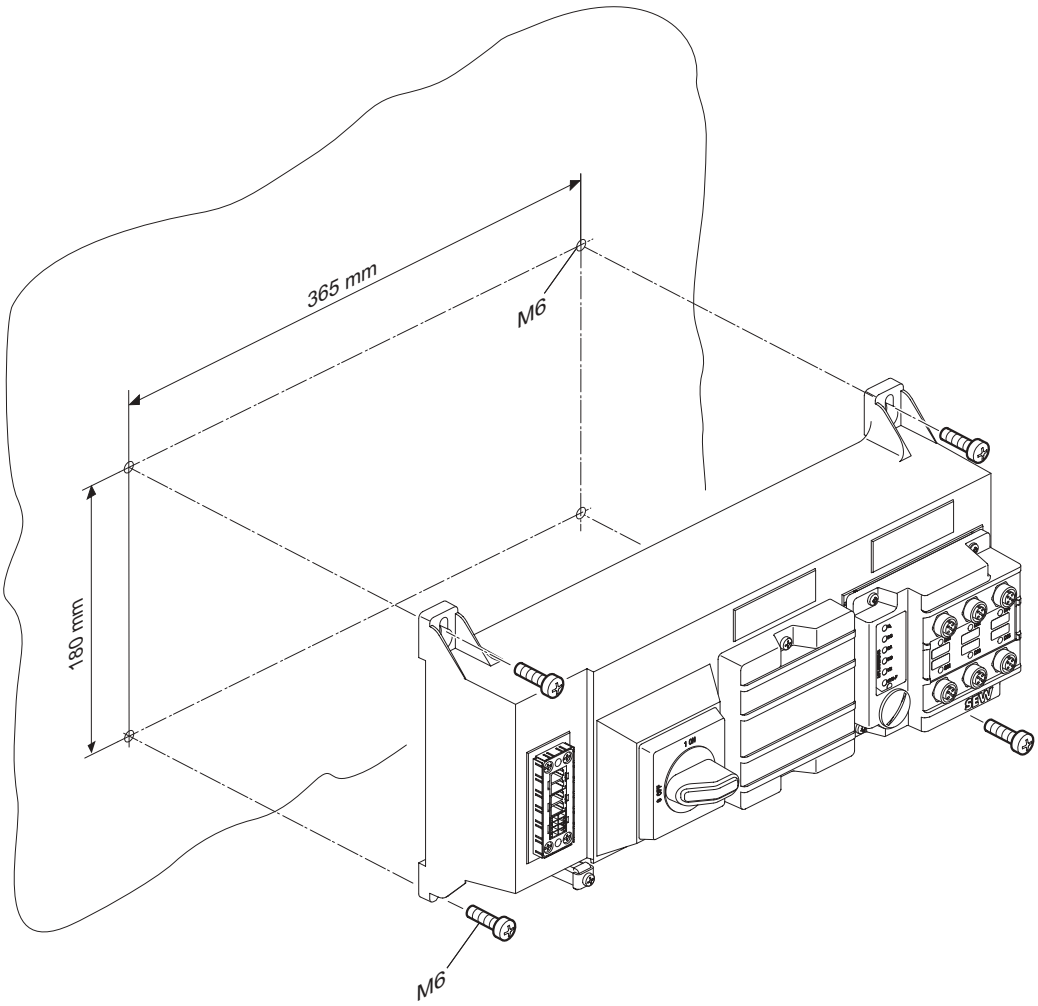
Installation of MF.../Z.6., MQ.../Z.6. field distributors

The following figure shows the mounting dimensions of ..Z.6. field distributors:



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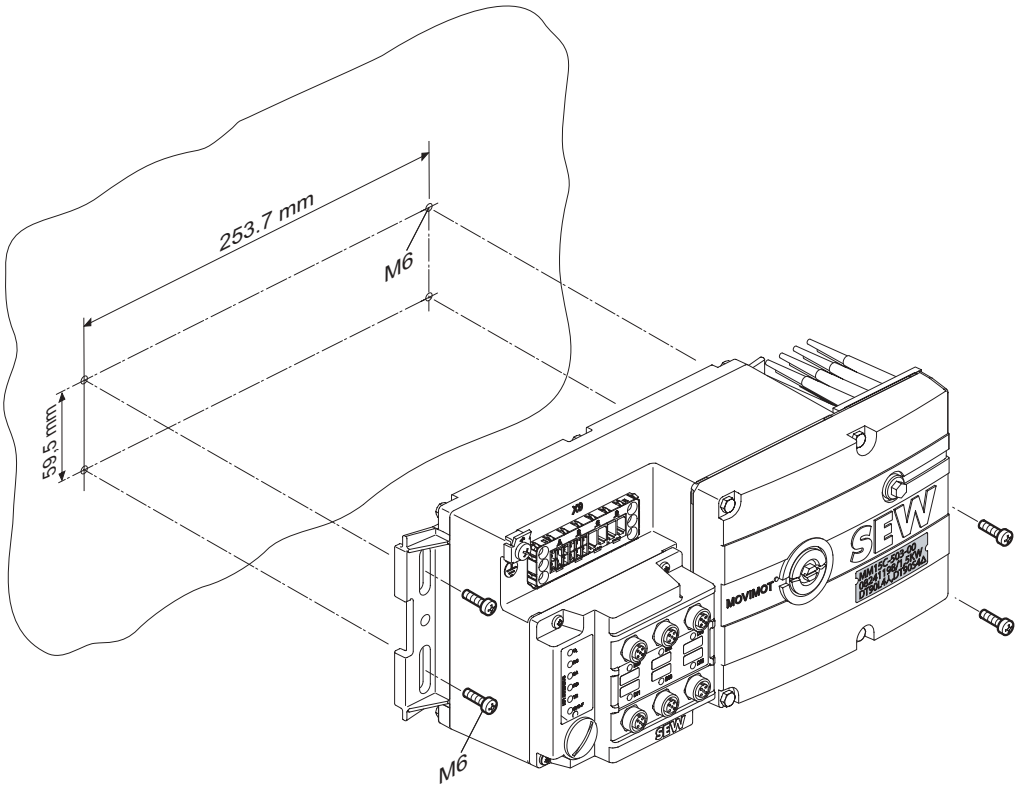
Installation of MF.../MM../Z.7., MQ.../MM../Z.7. field distributors

The ..Z.7. field distributors can be mounted as follows:

- Assembly on C-profile rail
- Wall mounting

"Wall mounting"

The following figure shows the wall-mounting dimensions for ..Z.7. field distributors:



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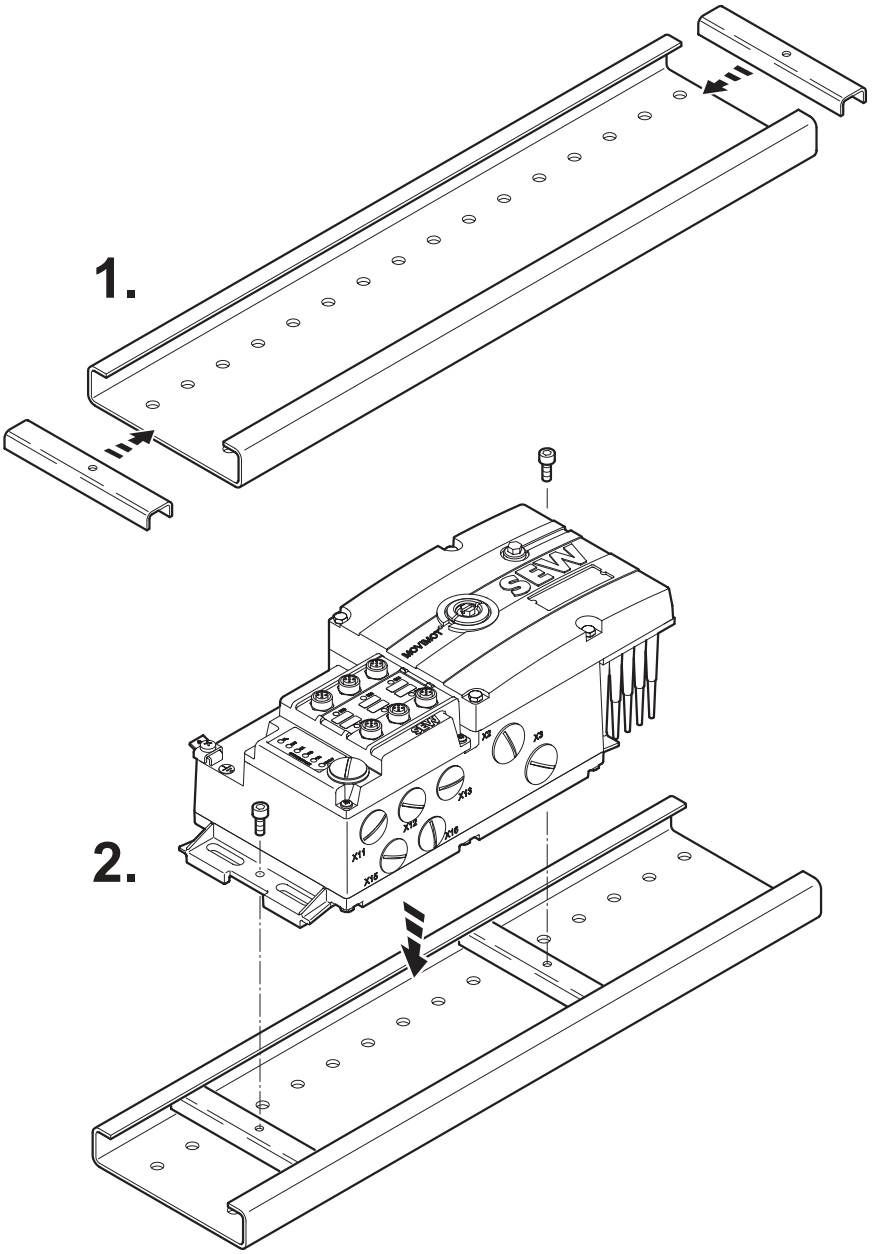
"Installation on C-profile rail"

The following figure shows the installation of the ..Z7. field distributor on a C-profile rail:



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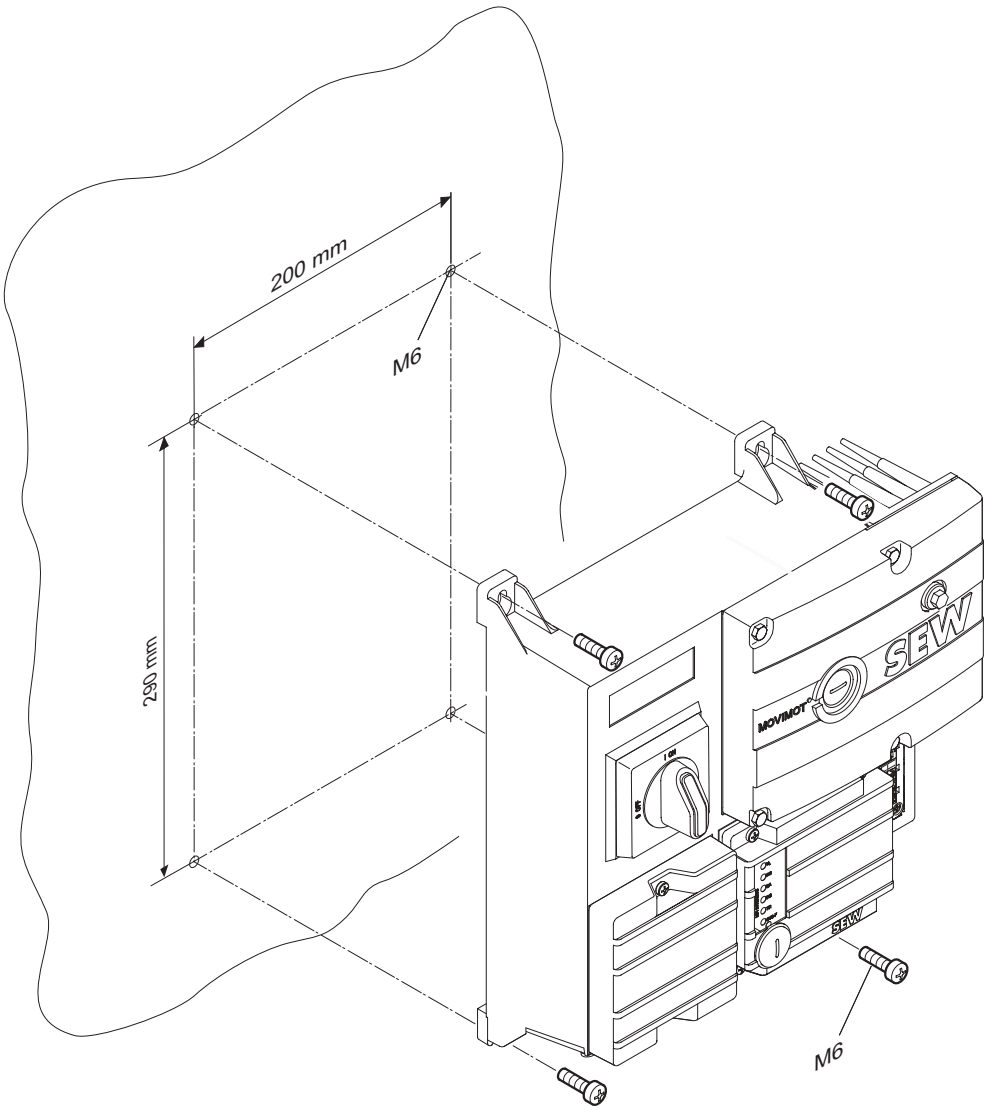
Installation of the MF.../MM03-MM15/Z.8., MQ.../MM03-MM15/Z.8. field distributors (size 1)

The following figure shows the mounting dimensions of ..Z.8. field distributor: (size 1):



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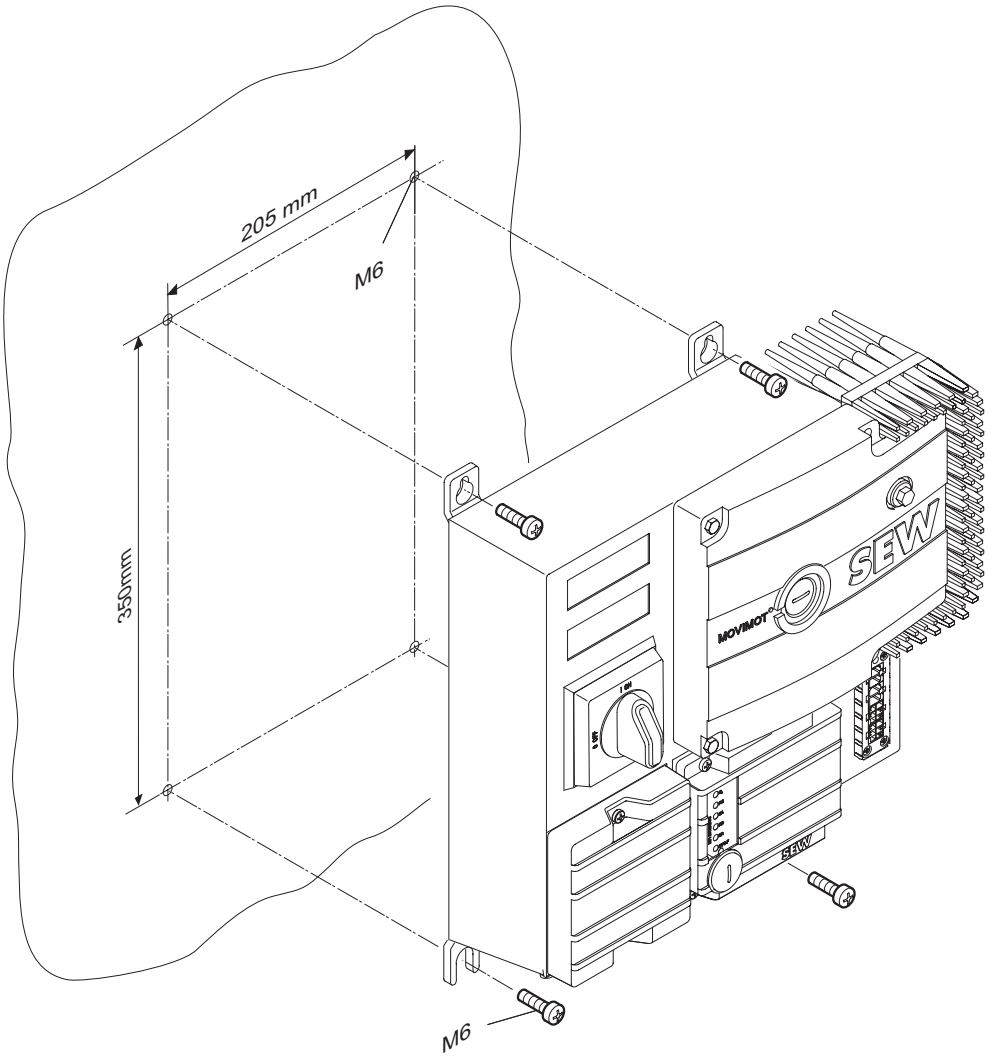
Installation of MF.../MM22-MM3X/Z.8., MQ.../MM22-MM3X/Z.8. field distributors (size 2)

The following figure shows the mounting dimensions of ..Z.8. field distributor: (size 2):



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6 Electrical Installation

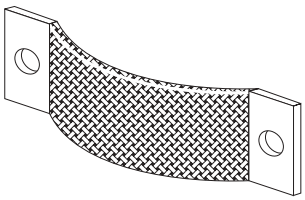
6.1 Installation planning under EMC aspects

Notes on arranging and routing installation components

Selecting the correct cables, providing correct grounding and a functioning equipotential bonding system are decisive factors in achieving a successful installation of decentralized drives.

The **relevant standards** must be applied in all cases. Particular attention should also be paid to the following points:

- **Equipotential bonding**
  - Low-impedance HF-capable potential compensation must be provided independent of the functional ground (PE terminal) (see also VDE 0113 or VDE 0100 Part 540) through, for example through:
    - Flat contact surface connection of metal (system) components
    - Use of ribbon grounding electrodes (RF litz wire)



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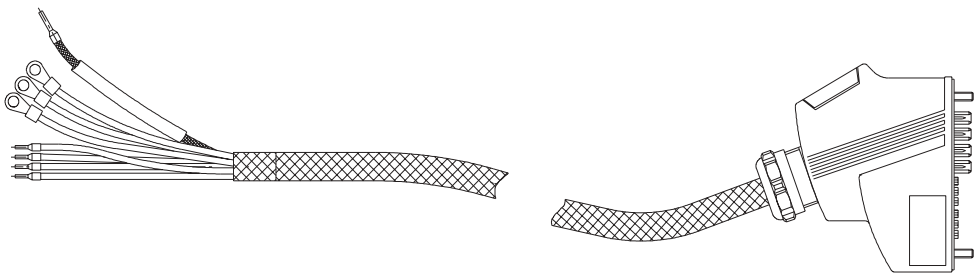
  - The cable shield of data cables must not be used for equipotential bonding.
- **Data lines and 24V dc supply**
  - These lines must be routed separately from cables subject to interference (such as control cables for solenoid valves, motor feeders).
- **Field distributors**
  - We recommend using pre-fabricated SEW hybrid cables especially designed for the connection of field distributors and motors.



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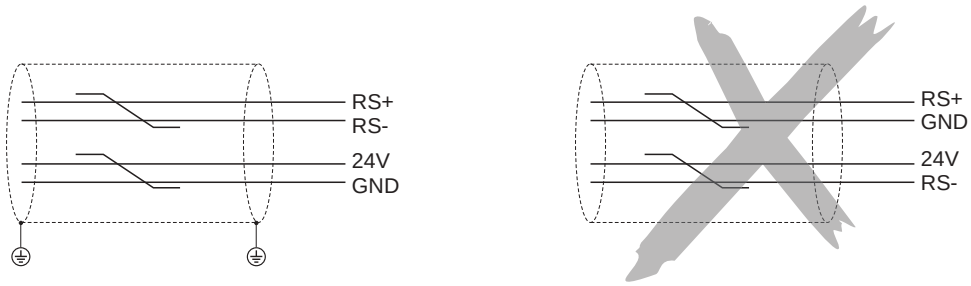
- **Cable glands**
  - Select a cable gland with large contact surface shield (consult the notes on selection and appropriate assembly of cable glands).
- **Cable shield**
  - This component must exhibit good EMC characteristics (high shield attenuation).
  - It may not serve as mere mechanical protection for the cable.
  - It must be connected with metal housing of the unit (via EMC metal cable glands) at the flat contact surface cable ends (consult the notes on selection and appropriate assembly of cable glands).
- **Additional information is available in the SEW publication "Drive Engineering – Practical Implementation, Electromagnetic Compatibility (EMC) in Drive Engineering."**

Example for connection of the MF../MQ.. fieldbus module and MOVIMOT®

If MF../MQ.. fieldbus module and MOVIMOT® are installed separately, the RS-485 connection must be implemented as follows:

- **Carrying the 24 V_{DC} supply**
  - Use shielded cables.
  - Apply shield to the housing on both units via EMC metal cable glands (for notes on the selection and appropriate assembly of cable glands see pages 26 and 27).
  - Strands twisted in pairs (see the following illustration).



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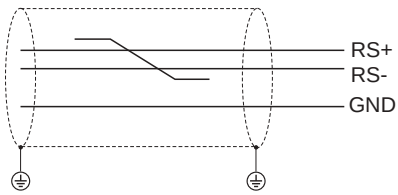
- **Without carrying the 24 V_{DC} supply:**

  If the MOVIMOT® is supplied with 24 V_{DC} via separate lead wire, the RS-485 connection must be designed as follows:

  - Use shielded cables.
  - Apply shield to the housing of both units via EMC metal cable glands (consult the notes on selection and appropriate assembly of cable glands).
  - The GND reference potential must generally be provided for the RS-485 interface.
  - Strands twisted (see the following illustration).



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6.2 Installation instructions fieldbus interfaces, field distributors

Connection of power cables

- The nominal voltage and frequency of the MOVIMOT® inverter must correspond to the data for the power supply system.
- Cable cross section: according to input current I_{mains} for rated power (see Technical Data).
- Install line fuses at the beginning of the power cable behind the supply bus junction. Use D, DO, NH fuses or circuit breakers. The fusible rating should be selected in accordance with the cable cross section.
- Do not use a conventional earth-leakage circuit breaker as a protective device. Universal current-sensitive earth-leakage circuit breakers ("type B") are permitted as a protective device. During normal operation of MOVIMOT® drives, earth-leakage currents of > 3.5 mA can occur.
- In accordance with EN 50178, a second PE connection (at least the same cross section as the power cable) parallel to the protective earth is required via separate points of connection. Earth-leakage currents > 3.5 mA may arise in service.
- Use contactor switch contacts to switch MOVIMOT® drives from utilization category AC-3 according to IEC 158.
- SEW recommends using earth-leakage monitors with pulse-code measurement for voltage supply systems with non-grounded star point (IT nets). The use of such devices avoids mis-tripping of the earth-leakage monitor due to the earth capacitance of the inverter.

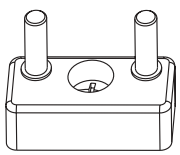
Permitted connection cross section and current carrying capacity of the terminals

	Power terminals X1, X21 (screw terminals)	**Control terminals X20 (cage clamp terminals)**
Connection cross section (mm^2)	0.2 mm^2 – 4 mm^2	0.08 mm^2 – 2.5 mm^2
Connection cross section (AWG)	AWG 24 – AWG 10	AWG 28 – AWG 12
Current carrying capacity	32 A max. continuous current	12 A max. continuous current

The permitted tightening torque of the power terminals is 0.6 Nm (5.3 lb.in).

Daisychaining the 24 V_{DC} supply voltage for MFZ.1 module carrier:

- Two M4 x 12 studs are located on the connection part of the 24 V_{DC} supply. These studs can be used for daisy-chaining the 24 V_{DC} supply voltage.



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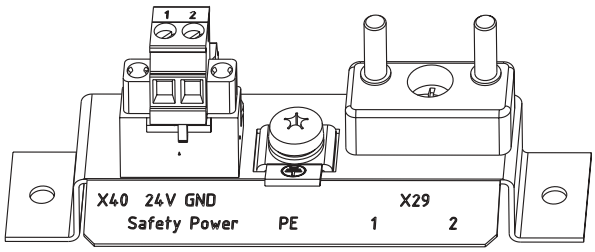
- The terminal studs have a current carrying capacity of 16 A.
- The permitted tightening torque for the hex nuts of the terminal studs is 1.2 Nm (10.6 lb.in) ± 20 %.

Additional connection options with MFZ.6, MFZ.7 and MFZ.8 field distributor

- The connection part of the 24 V_{DC} supply comprises a X29 terminal block with two M4 x 12 studs and a pluggable X40 terminal.



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- The X29 terminal block can be used an an alternative to the X20 terminal for daisy-chaining the 24 V_{DC} supply voltage. The two studs are connected internally with the 24 V connection on terminal X20.

Terminal assignment			
No.		**Name**	**Function**
X29	1	24 V	24 V voltage supply for module electronics and sensors (stud, jumpered with terminal X20/11)
	2	GND	0V24 reference potential for module electronics and sensors (stud, jumpered with terminal X20/13)

- The pluggable X40 terminal ("Safety Power") is intended for the external 24 V_{DC} supply of the MOVIMOT® inverter via a safety reset device.

Terminal assignment			
No.		**Name**	**Function**
X40	1	24 V	24 V MOVIMOT voltage supply for disconnection with safety reset device
	2	GND	0V24 MOVIMOT reference potential for disconnection with safety reset device

This setup makes for the operation of a MOVIMOT® drive in safety applications. Corresponding information is available in the documentation "Safe Disconnection for MOVIMOT®."

- Terminal X29/1 is factory-jumpered with X40/1 and terminals X29/2 with X40/2 so that the MOVIMOT® inverter is supplied by the same 24 V_{DC} voltage as the fieldbus module.
- The current carrying capacity of both studs is 16 A, the permitted tightening torque of the hex nuts is 1.2 Nm (10.6 lb.in) ± 20 %.
- The current carrying capacity of screw terminal X40 is 10 A, the connection cross section is 0.25 mm^2 to 2.5 mm^2 (AWG24 to AWG12) and the permitted tightening torque is 0.6 Nm (5.3 lb.in).

Installation at 1000 meters above sea level (msl)

MOVIMOT® drives with supply voltages of 380 to 500 V can be used at altitudes above 2000 msl up to 4000 msl under the following peripheral conditions.

- The rated continuous power is reduced based on the reduced cooling above 1000 m (see the section MOVIMOT® Operating Instructions).
- At 2000 msl, the air and creeping distances are only sufficient for overvoltage class 2. If the installation requires overvoltage class 3, an additional external overvoltage protection must be used to ensure that overvoltage surges are limited to 2.5 kV phase-to-phase and phase-to-ground.
- If safe electrical separation is required, it must be implemented outside the device at altitudes of 2000 msl (safe electrical separation in accordance with EN 50178).
- The permitted rated supply voltage of 3 x 500 V up to 2000 msl is reduced by 6 V for every 100 m to a maximum of 3 x 380 V at 4000 msl.

Protective devices

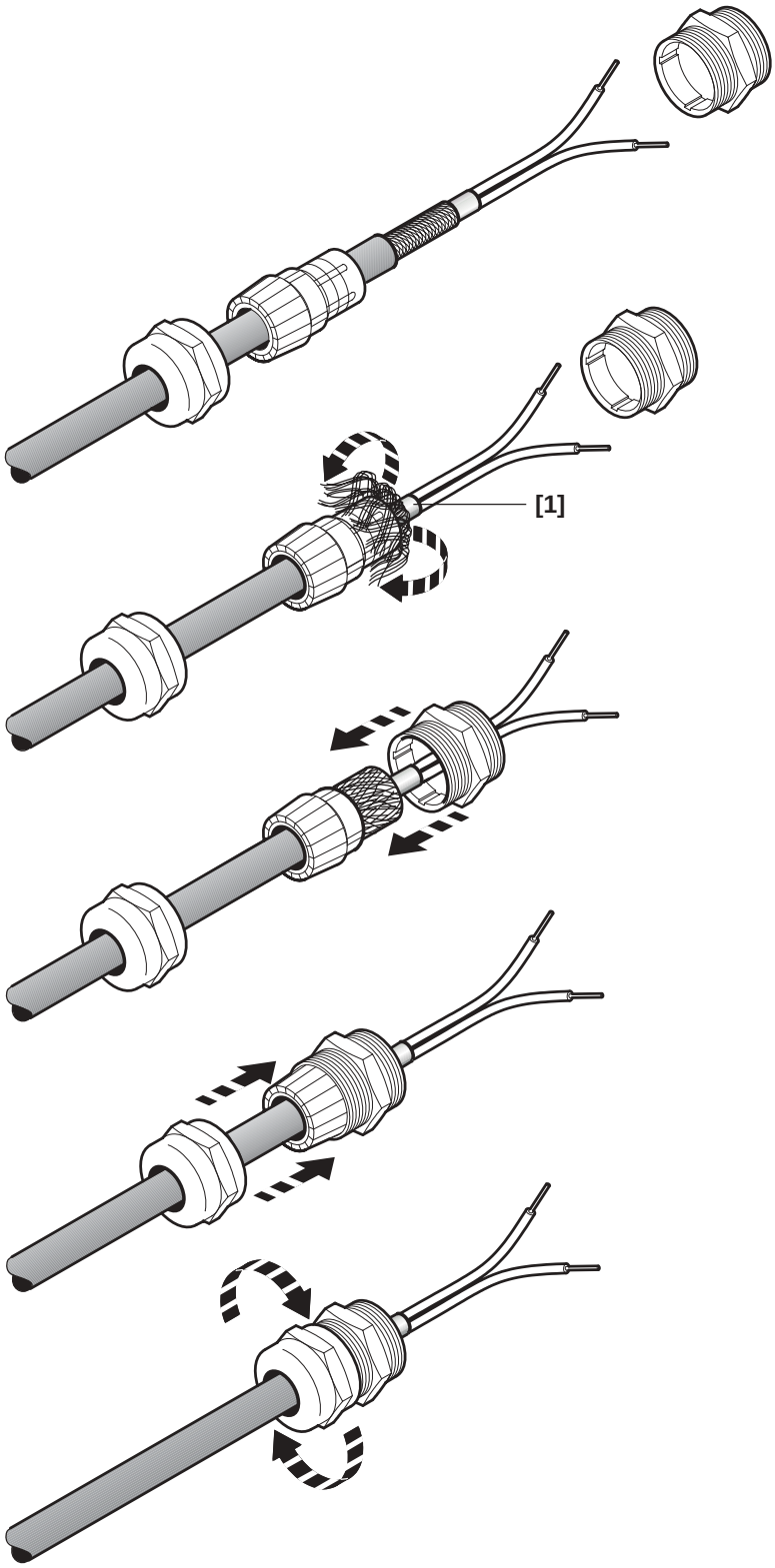
- MOVIMOT® drives are equipped with integrated protective overload devices that are making external devices obsolete.

UL compliant field distributor installation

- Use only copper cables with the following temperature ranges as connection cables: Temperature range: 60 / 75 °C
- MOVIMOT® drives are suited for operation on voltage supply systems with grounded star point (TN and TT systems) providing a maximum supply current of 5000 A_{AC} and having a maximum rated voltage of 500 V_{AC} (MM03C-503 to MM3XC-503). The performance data of the fuses must not exceed 35 A/600 V when operated with field distributor.
- Use only tested units with limited output voltage (Umax = 30 V_{DC}) and limited output current (I = 8 A) as external 24 V_{DC} voltage supply source.
- UL certification applies only to operation in voltage supply systems with voltages to ground up to 300 V.

EMC metal cable glands

EMC metal cable glands supplied by SEW must be installed as follows:



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[1] Important: Cut off insulation foil, but do not fold it back!

Wiring check

Before connecting power to the system for the first time, it is necessary to perform a wiring check to **prevent damage to persons, systems and equipment** caused by incorrect wiring.

- Disconnect all bus modules from the connection module
- Disconnect all MOVIMOT® inverters from the connection module (only with MFZ.7, MFZ.8)
- Disconnect all plug connectors of the motor outputs (hybrid cable) from the field distributor.
- Check the insulation of the cabling in accordance with applicable national standards.
- Check the grounding.
- Check whether power cable and 24 V_{DC} cable are insulated.
- Check whether power cable and communication cable are insulated.
- Check the polarity of the 24 V_{DC} cable.
- Check the polarity of the communication cable.
- Check the mains phase sequence.
- Ensure equipotential bonding between the fieldbus interfaces.

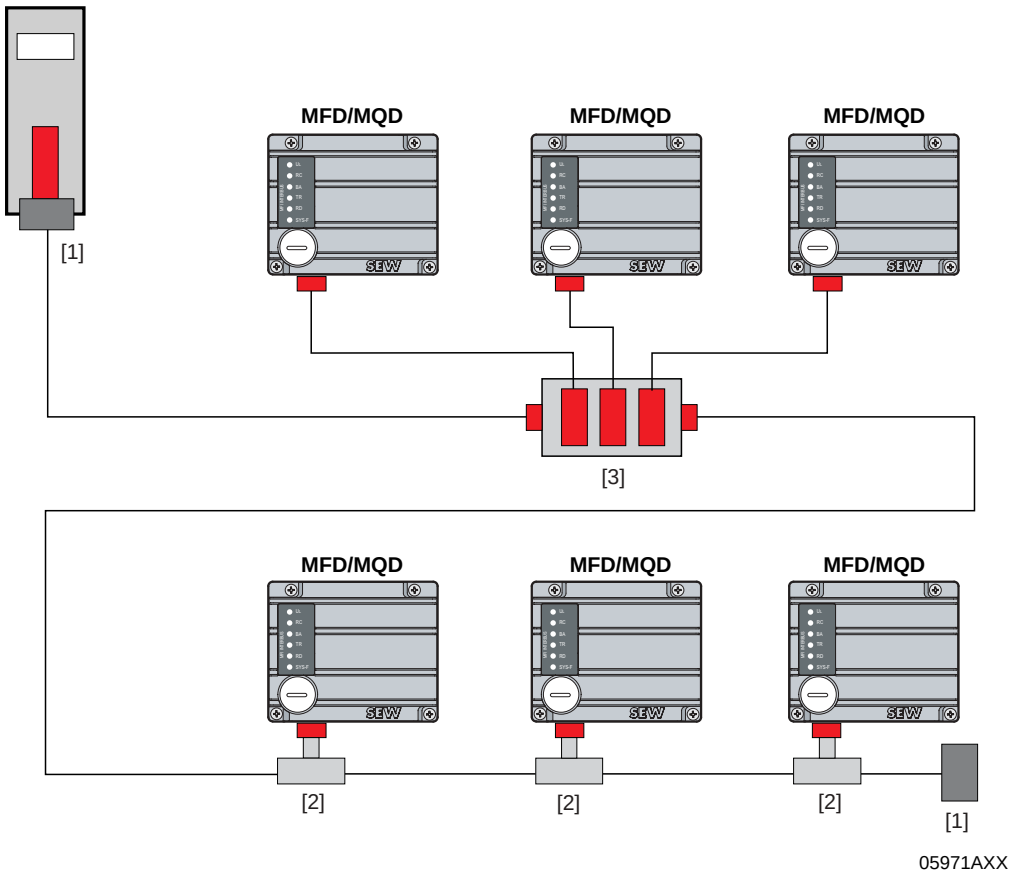
After the wiring check

- Connect and fasten all motor outputs (hybrid cable).
- Connect and fasten all bus modules.
- Install and fasten all MOVIMOT® inverters (for MFZ.7, MFZ.8 only).
- Install all terminal box covers.
- Cover plug connections not in use.

6.3 Connection with DeviceNet

DeviceNet connection capabilities

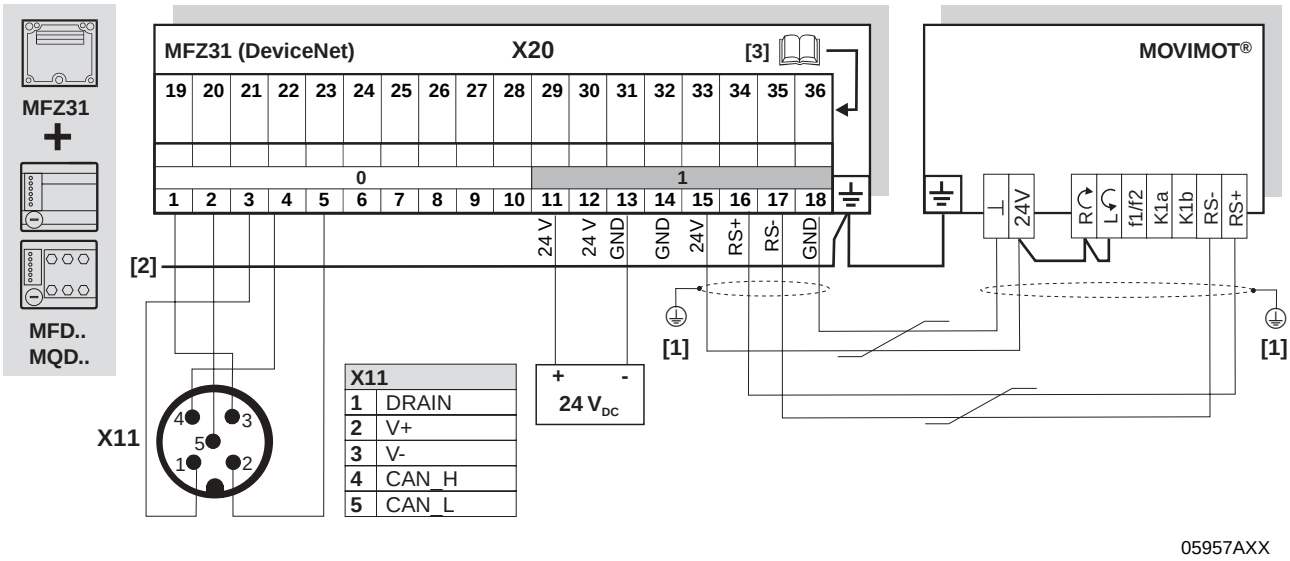
MFD/MQD fieldbus interfaces can be connected via multiport or T connector. If the connection with MFD/MQD is removed, the remaining stations will not be influenced and the bus can remain active.



[1] Bus terminating resistor 120 Ω
[2] T connector
[3] Multiport

Observe the wiring regulations in accordance with DeviceNet specification 2.0!

MFZ31 connection with MOVIMOT® (in combination with DeviceNet)



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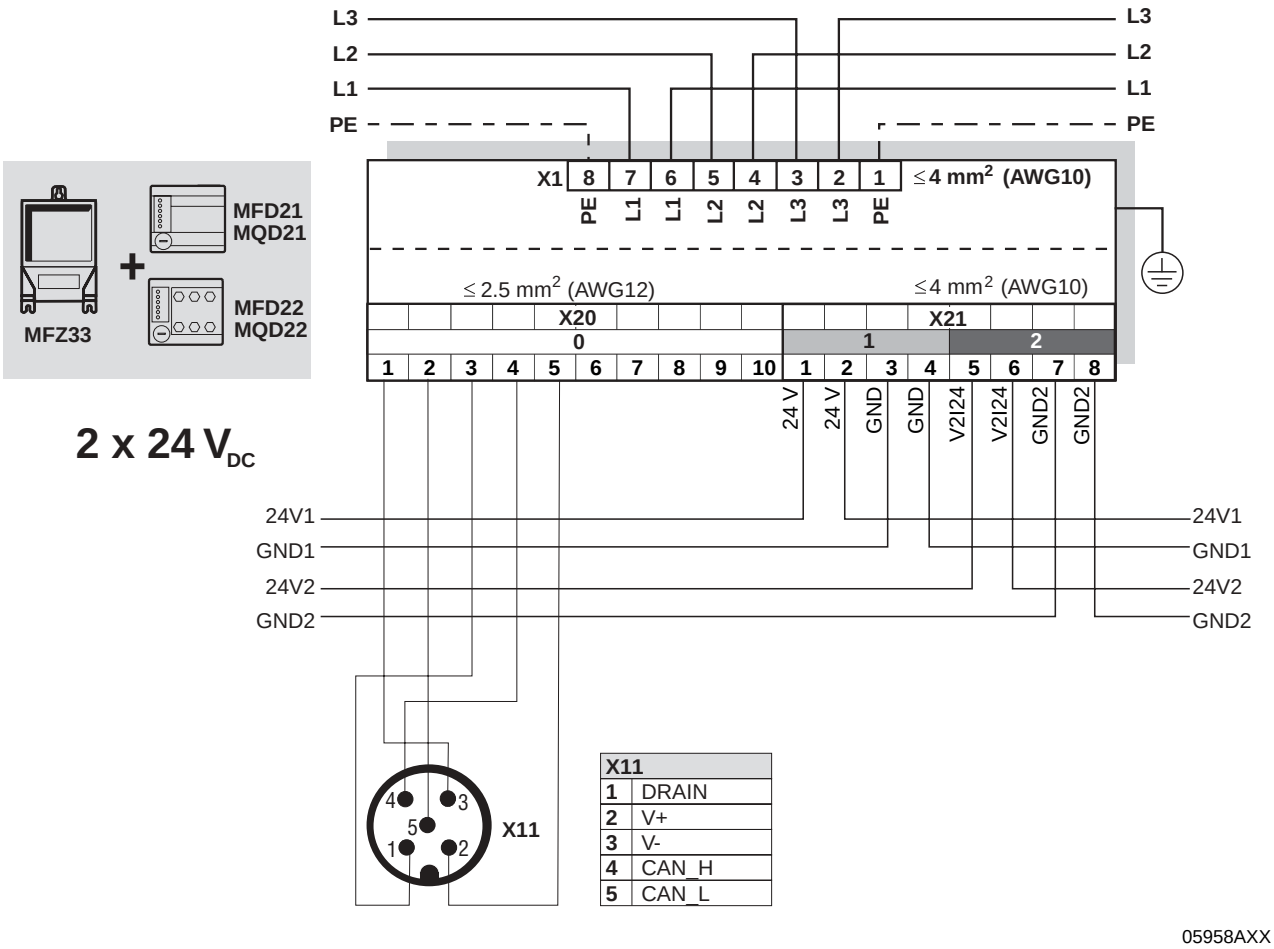
0 = Potential level 0 **1** = Potential level 1

[1] If MFZ31/MOVIMOT® are mounted separately:
Connect the shield of the RS-485 cable using the EMC metal cable screw fitting on MFZ and the MOVIMOT® housing.
[2] Ensure equipotential bonding between all bus stations.
[3] Assignment of terminals 19-36 starting on page 55

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	V-	Input	DeviceNet reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	DRAIN	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	V+	Input	DeviceNet voltage supply 24 V
	6	-	-	Reserved
	7	-	-	Reserved
	8	-	-	Reserved
	9	-	-	Reserved
	10	-	-	Reserved
	11	24 V	Input	24 V voltage supply for module electronics and sensors
	12	24 V	Output	24 V voltage supply (jumpered with terminal X20/11)
	13	GND	-	0V24 reference potential for module electronics and sensors
	14	GND	-	0V24 reference potential for module electronics and sensors
	15	24 V	Output	24 V voltage supply for MOVIMOT® (jumpered with terminal X20/11)
	16	RS+	Output	Communication link to MOVIMOT® terminal RS+
	17	RS-	Output	Communication link to MOVIMOT® terminal RS-
	18	GND	-	0V24 reference potential for MOVIMOT® (jumpered with terminal X20/13)

Connection of MFZ33 field distributor with MFD/MQD..

MFZ33 connection module with MFD/MQD21, MFD/MQD22 fieldbus module and two separate 24 V_{DC} voltage circuits



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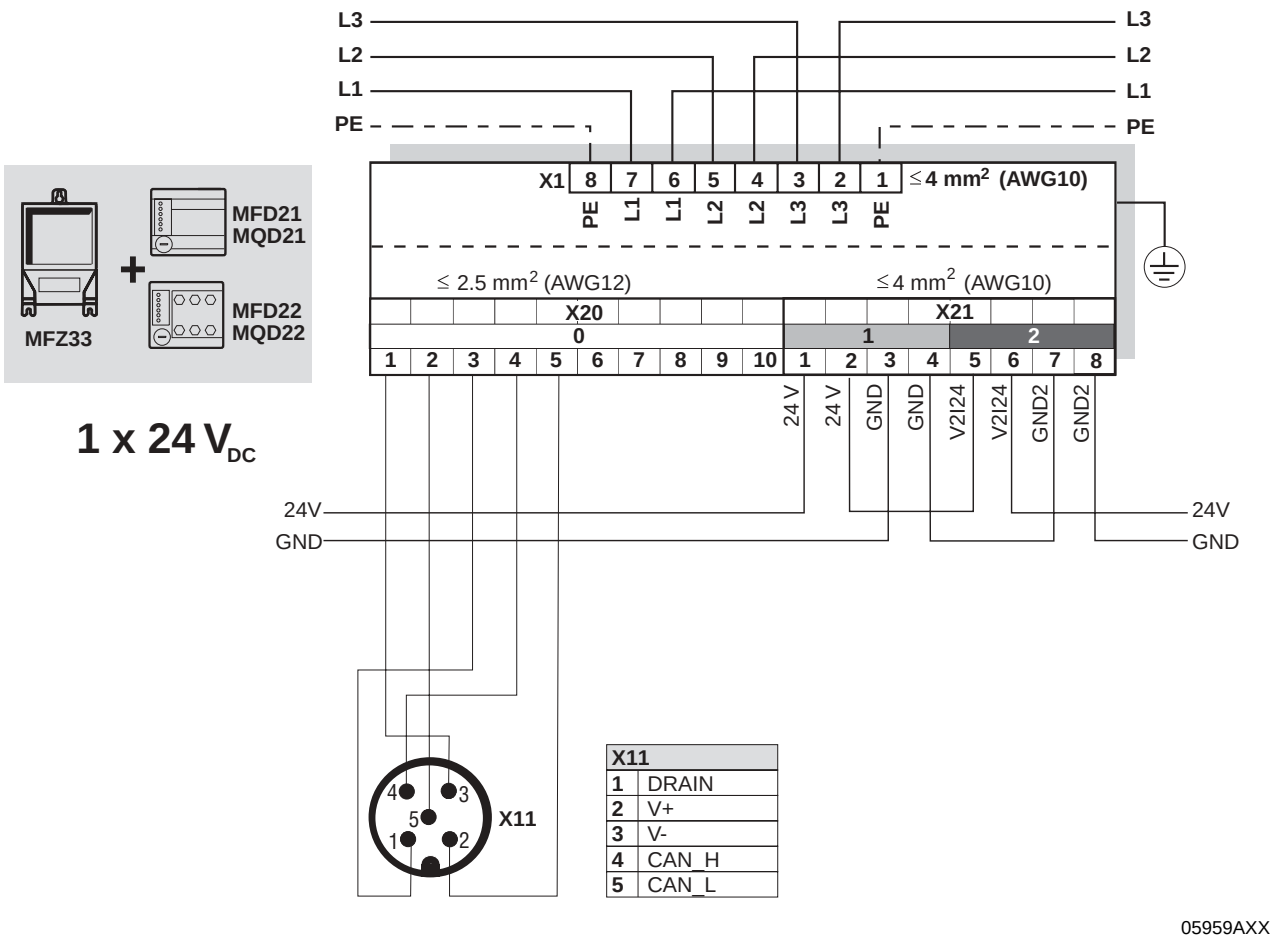
0 = Potential level 0 **1** = Potential level 1 2 = Potential level 2

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	V-	Input	DeviceNet reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	DRAIN	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	V+	Input	DeviceNet voltage supply 24 V
	6-10	-	-	Reserved
X21	**1**	24 V	Input	24 V voltage supply for module electronics, sensors and MOVIMOT®
	2	24 V	Output	24 V voltage supply (jumpered with terminal X21/1)
	3	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	4	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	5	V2I24	Input	24 V voltage supply for actuators (digital outputs)
	6	V2I24	Output	24 V voltage supply for actuators (digital outputs) jumpered with terminal X21/5
	7	GND2	-	0V24V reference potential for actuators
	8	GND2	-	0V24V reference potential for actuators

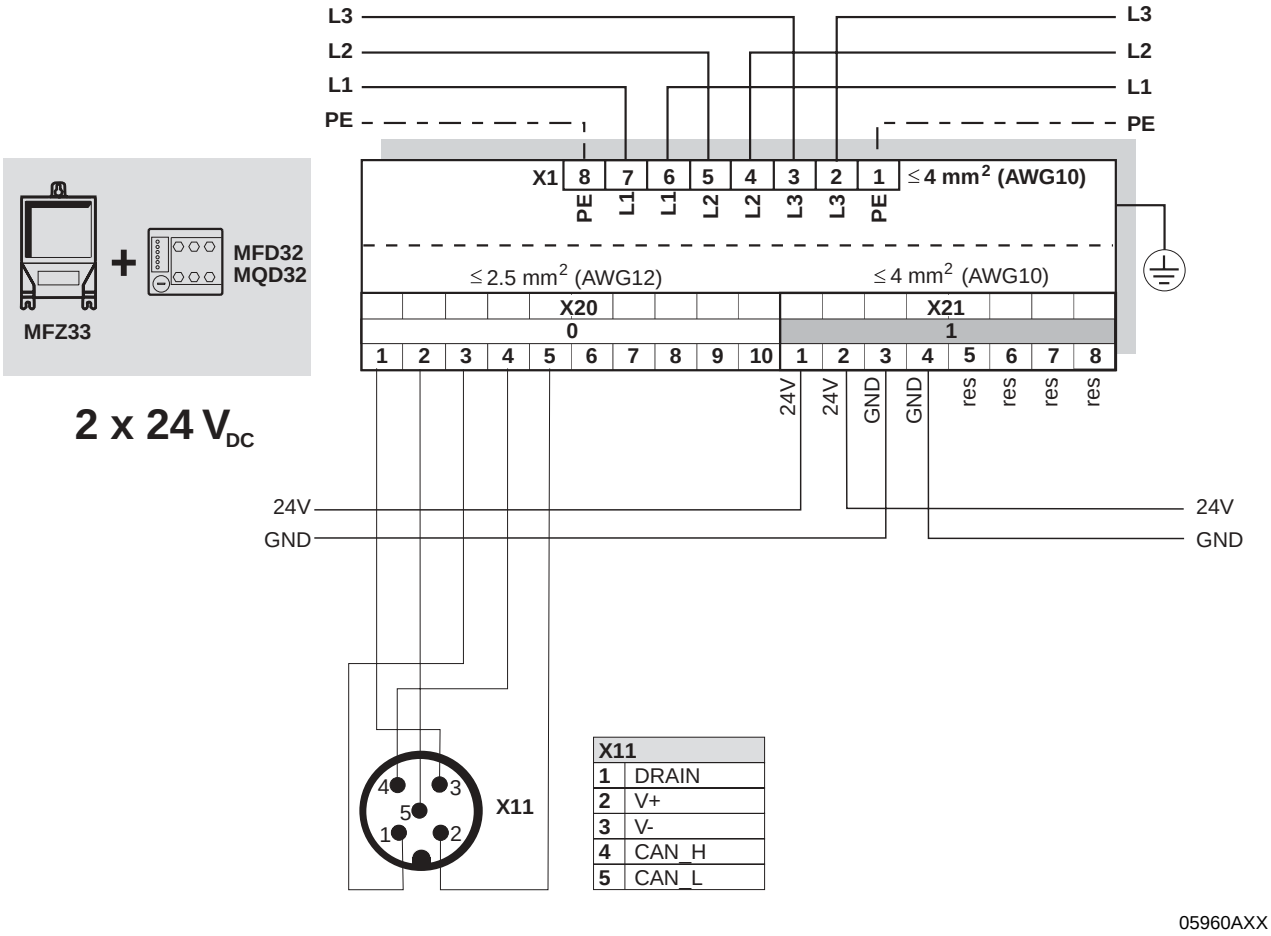
MFZ33 connection module with MFD/MQD21, MFD/MQD22 fieldbus module and one common 24 V_{DC} voltage circuit



0 = Potential level 0 **1** = Potential level 1 2 = Potential level 2

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	V-	Input	DeviceNet reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	DRAIN	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	V+	Input	DeviceNet voltage supply 24 V
	6-10	-	-	Reserved
X21	**1**	24 V	Input	24 V voltage supply for module electronics, sensors and MOVIMOT®
	2	24 V	Output	24 V voltage supply (jumpered with terminal X21/1)
	3	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	4	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	5	V2I24	Input	24 V voltage supply for actuators (digital outputs)
	6	V2I24	Output	24 V voltage supply for actuators (digital outputs) jumpered with terminal X21/5
	7	GND2	-	0V24V reference potential for actuators
	8	GND2	-	0V24V reference potential for actuators

MFZ33 connection module with MFD/MQD32 fieldbus module

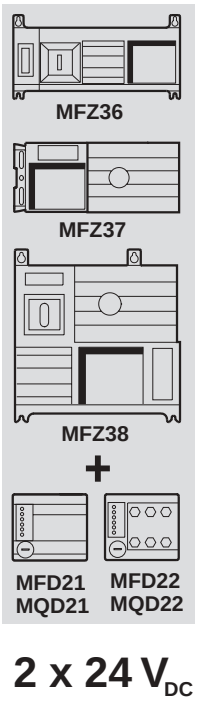


0 = Potential level 0 **1** = Potential level 1

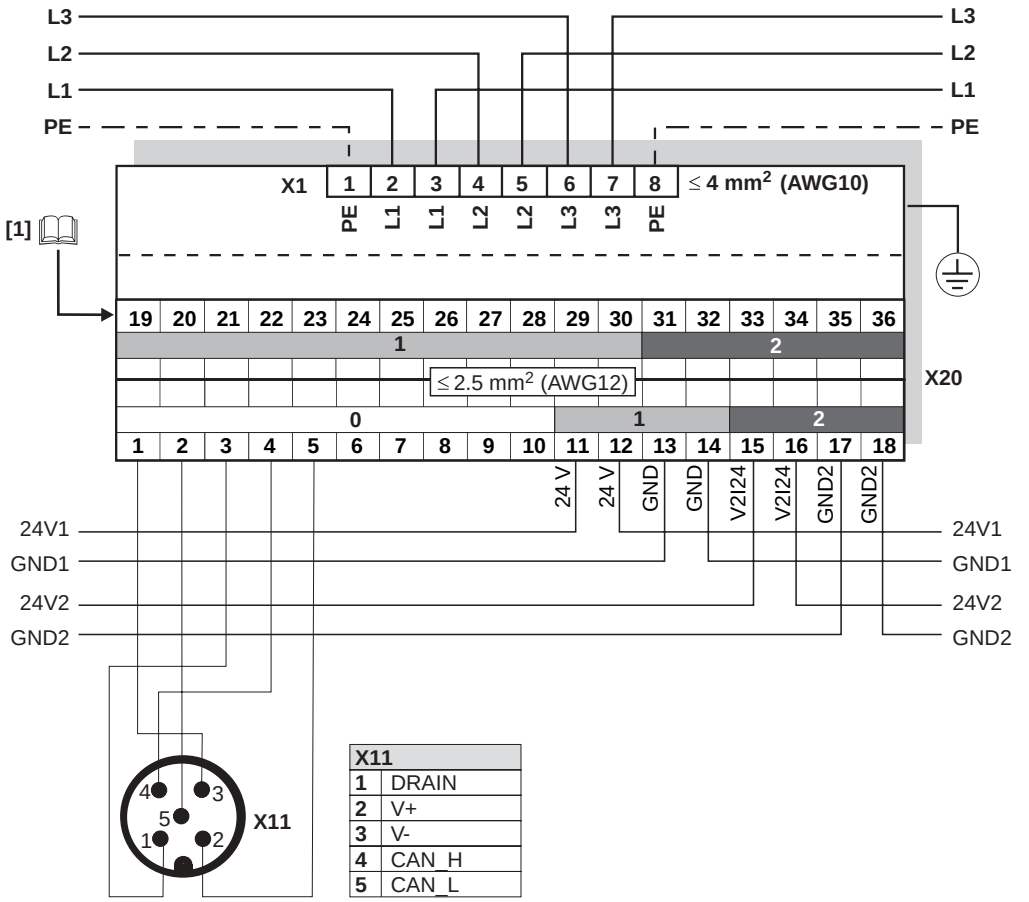
Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	V-	Input	DeviceNet reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	DRAIN	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	V+	Input	DeviceNet voltage supply 24 V
	6-10	-	-	Reserved
X21	**1**	24 V	Input	24 V voltage supply for module electronics, sensors and MOVIMOT®
	2	24 V	Output	24 V voltage supply (jumpered with terminal X21/1)
	3	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	4	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	5-8	-	-	Reserved

Connection of MFZ36, MFZ37, MFZ38 field distributors with MFD/MQD..

MFZ36, MFZ37, MFZ38 connection modules with MFD/MQD21, MFD/MQD22 fieldbus module and two separate 24 V_{DC} voltage circuits



2 x 24 V_{DC}



X11	
1	DRAIN
2	V+
3	V-
4	CAN_H
5	CAN_L

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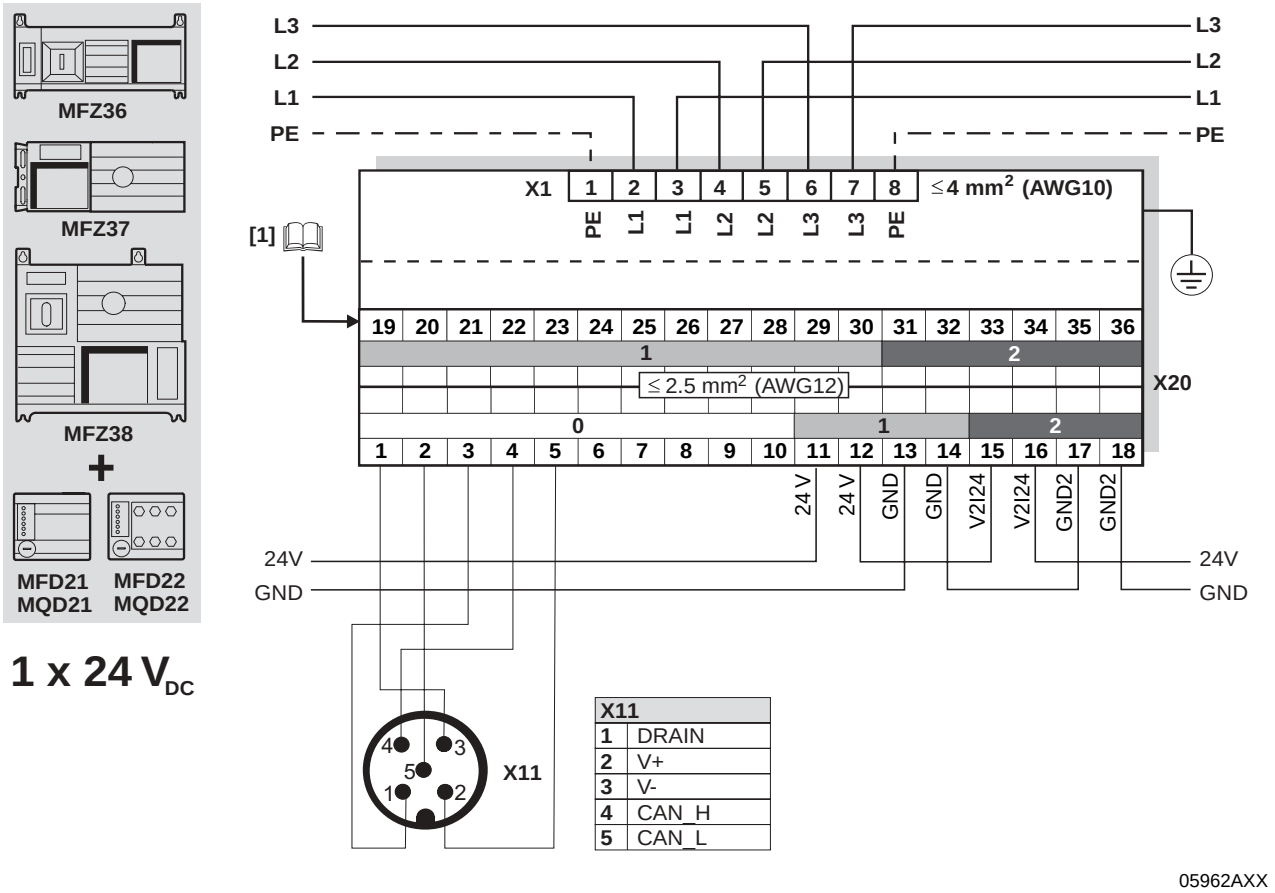
0 = Potential level 0 **1** = Potential level 1 2 = Potential level 2

[1] 📖 Assignment of terminals 19-36 starting on page 55

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	V-	Input	DeviceNet reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	DRAIN	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	V+	Input	DeviceNet voltage supply 24 V
	6-10	-	-	Reserved
	11	24 V	Input	24 V voltage supply for module electronics and sensors
	12	24 V	Output	24 V voltage supply (jumpered with terminal X20/11)
	13	GND	-	0V24 reference potential for module electronics and sensors
	14	GND	-	0V24 reference potential for module electronics and sensors
	15	V2I24	Input	24 V voltage supply for actuators (digital outputs)
	16	V2I24	Output	24 V voltage supply for actuators (digital outputs) jumpered with terminal X20/15
	17	GND2	-	0V24V reference potential for actuators
	18	GND2	-	0V24V reference potential for actuators

MFZ36, MFZ37, MFZ38 connection modules with MFD/MQD21, MFD/MQD22 fieldbus module and one common 24 V_{DC} voltage circuit:

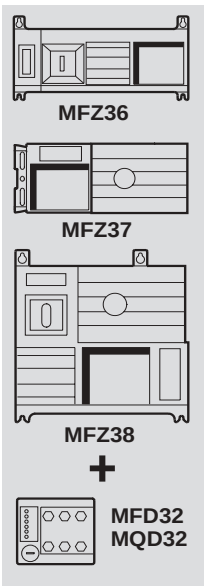


0 = Potential level 0 | 1 = Potential level 1 | 2 = Potential level 2

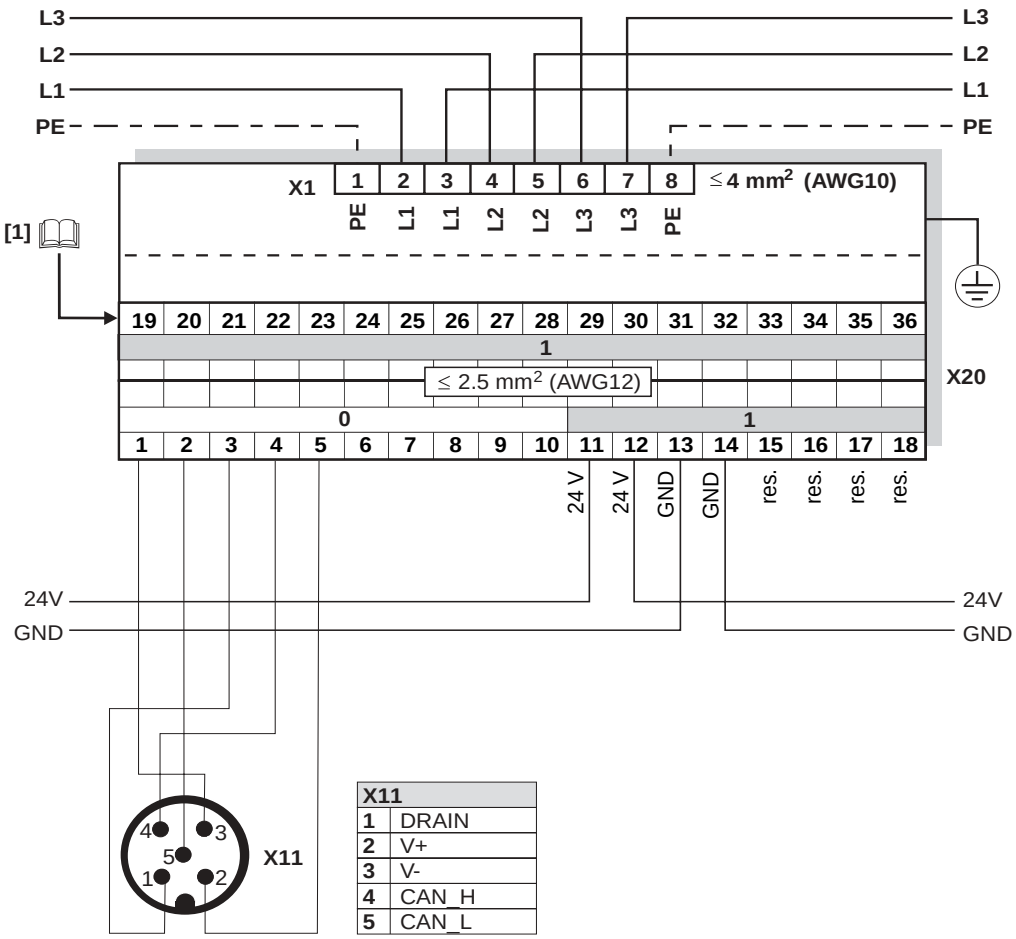
[1] Assignment of terminals 19-36 starting on page 55

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	V-	Input	DeviceNet reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	DRAIN	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	V+	Input	DeviceNet voltage supply 24 V
	6- 10	-	-	Reserved
	11	24 V	Input	24 V voltage supply for module electronics and sensors
	12	24 V	Output	24 V voltage supply (jumpered with terminal X20/11)
	13	GND	-	0V24 reference potential for module electronics and sensors
	14	GND	-	0V24 reference potential for module electronics and sensors
	15	V2I24	Input	24 V voltage supply for actuators (digital outputs)
	16	V2I24	Output	24 V voltage supply for actuators (digital outputs) jumpered with terminal X20/15
	17	GND2	-	0V24V reference potential for actuators
	18	GND2	-	0V24V reference potential for actuators

MFZ36, MFZ37, MFZ38 connection modules with MFD/MQD32 fieldbus module



1 x 24 V_{DC}



X11	
1	DRAIN
2	V+
3	V-
4	CAN_H
5	CAN_L

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0 = Potential level 0 **1** = Potential level 1

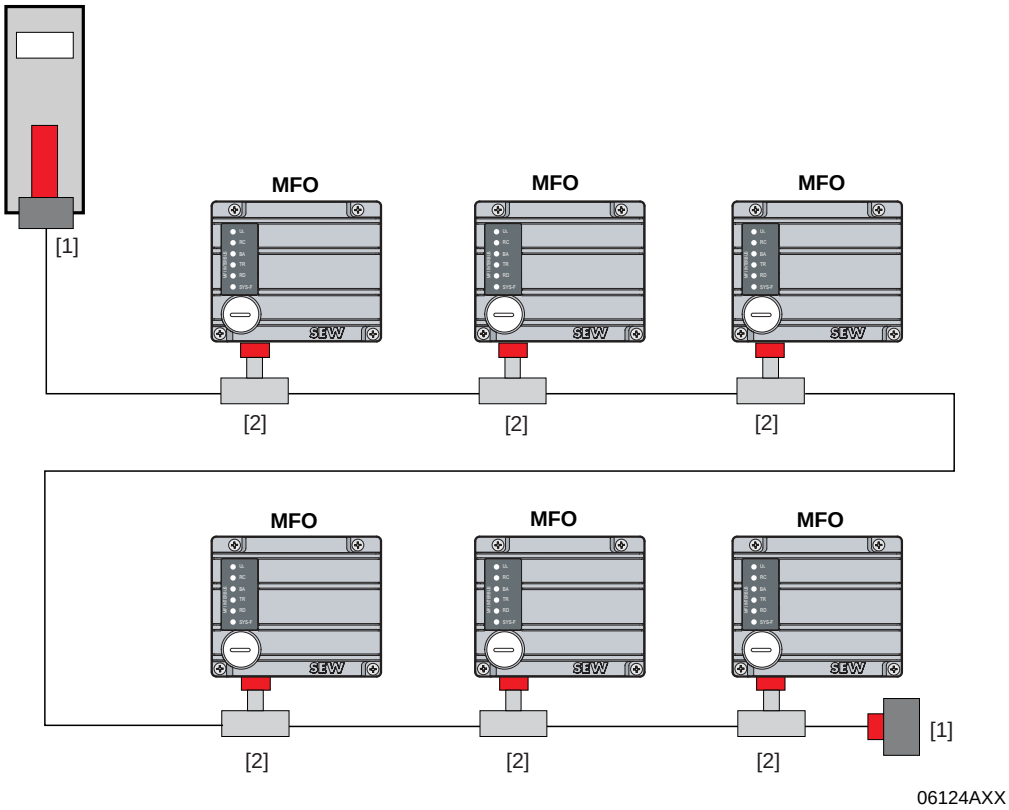
[1] 📖 Assignment of terminals 19-36 starting on page 55

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	V-	Input	DeviceNet reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	DRAIN	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	V+	Input	DeviceNet voltage supply 24 V
	6-10	-	-	Reserved
	11	24 V	Input	24 V voltage supply for module electronics and sensors
	12	24 V	Output	24 V voltage supply (jumpered with terminal X20/11)
	13	GND	-	0V24 reference potential for module electronics and sensors
	14	GND	-	0V24 reference potential for module electronics and sensors
	15-18	-	-	Reserved

6.4 Connection with CANopen

CANopen connection capabilities

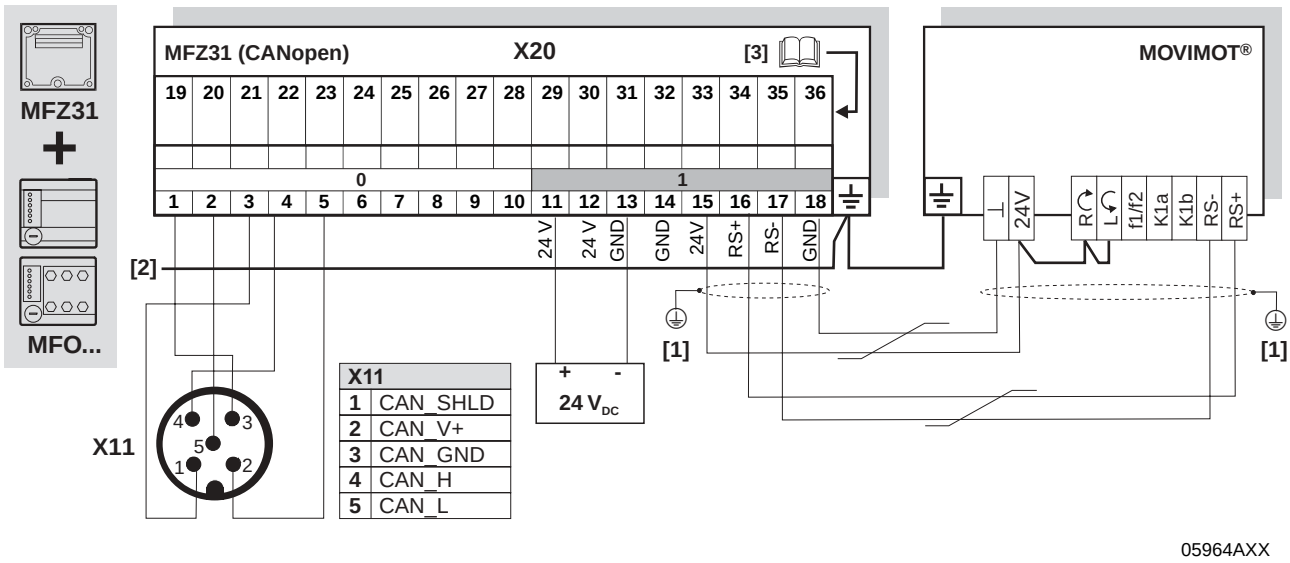
MFO fieldbus interfaces are connected via T connector. If the connection with MFD/MQD is removed, the remaining stations will not be influenced and the bus can remain active.



[1] Bus terminating resistor 120 Ω
[2] T connector

Observe the wiring regulations in accordance with CANopen specification DR(P) 303!

MFZ31 connection with MOVIMOT® (in combination with CANopen)



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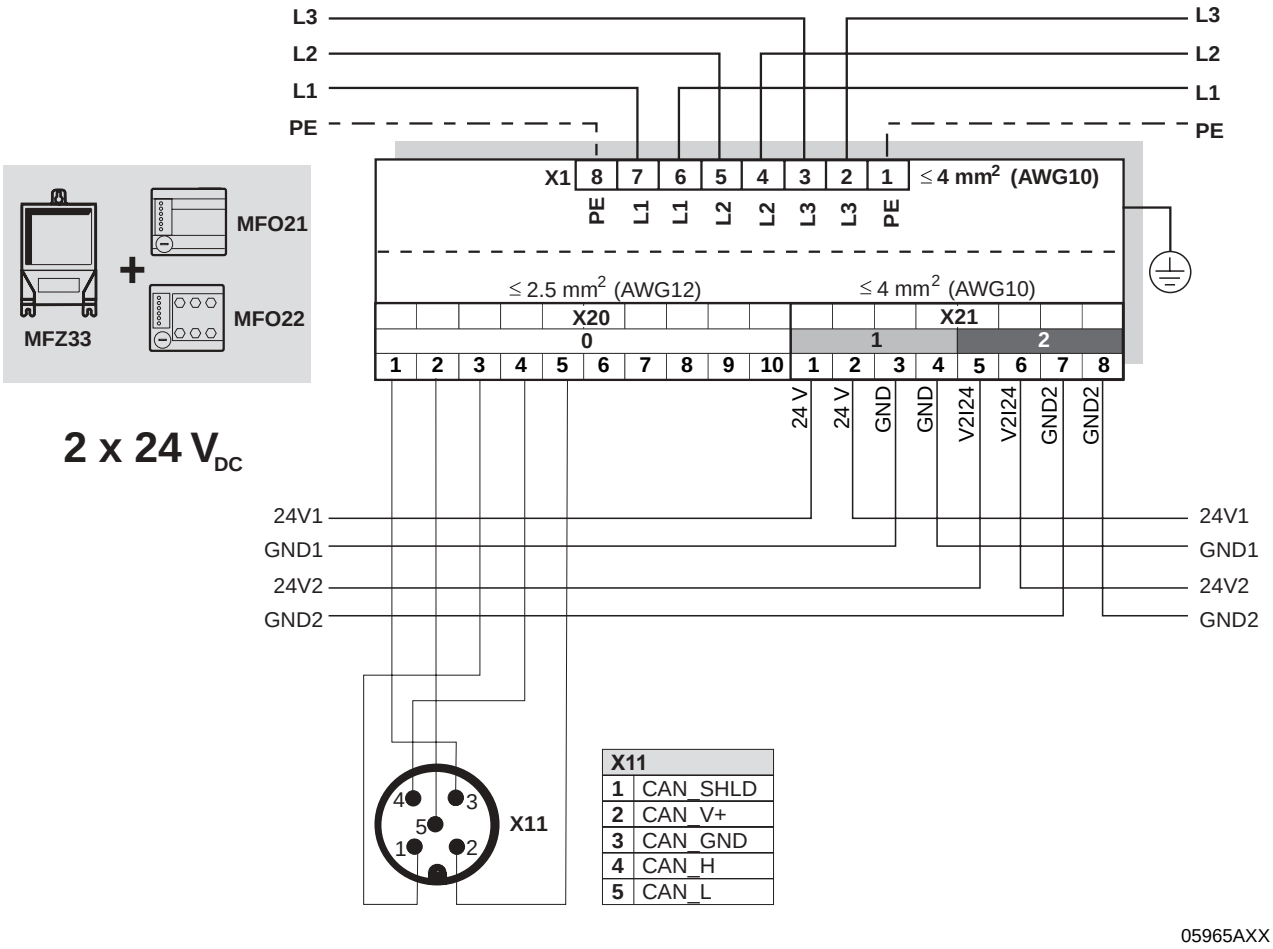
0 = Potential level 0 **1** = Potential level 1

[1] If MFZ31/MOVIMOT® are mounted separately:
Connect the shield of the RS-485 cable using the EMC metal cable screw fitting on MFZ and the MOVIMOT® housing.
[2] Ensure equipotential bonding between all bus stations.
[3] Assignment of terminals 19-36 starting on page 55

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	CAN_GND	Input	CANopen reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	CAN_SHLD	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	CAN_V+	Input	CANopen voltage supply 24 V
	6	-	-	Reserved
	7	-	-	Reserved
	8	-	-	Reserved
	9	-	-	Reserved
	10	-	-	Reserved
	11	24 V	Input	24 V voltage supply for module electronics and sensors
	12	24 V	Output	24 V voltage supply (jumpered with terminal X20/11)
	13	GND	-	0V24 reference potential for module electronics and sensors
	14	GND	-	0V24 reference potential for module electronics and sensors
	15	24 V	Output	24 V voltage supply for MOVIMOT® (jumpered with terminal X20/11)
	16	RS+	Output	Communication link to MOVIMOT® terminal RS+
	17	RS-	Output	Communication link to MOVIMOT® terminal RS-
	18	GND		0V24 reference potential for MOVIMOT® (jumpered with terminal X20/13)

Connection of MFZ33 field distributor with MFO...

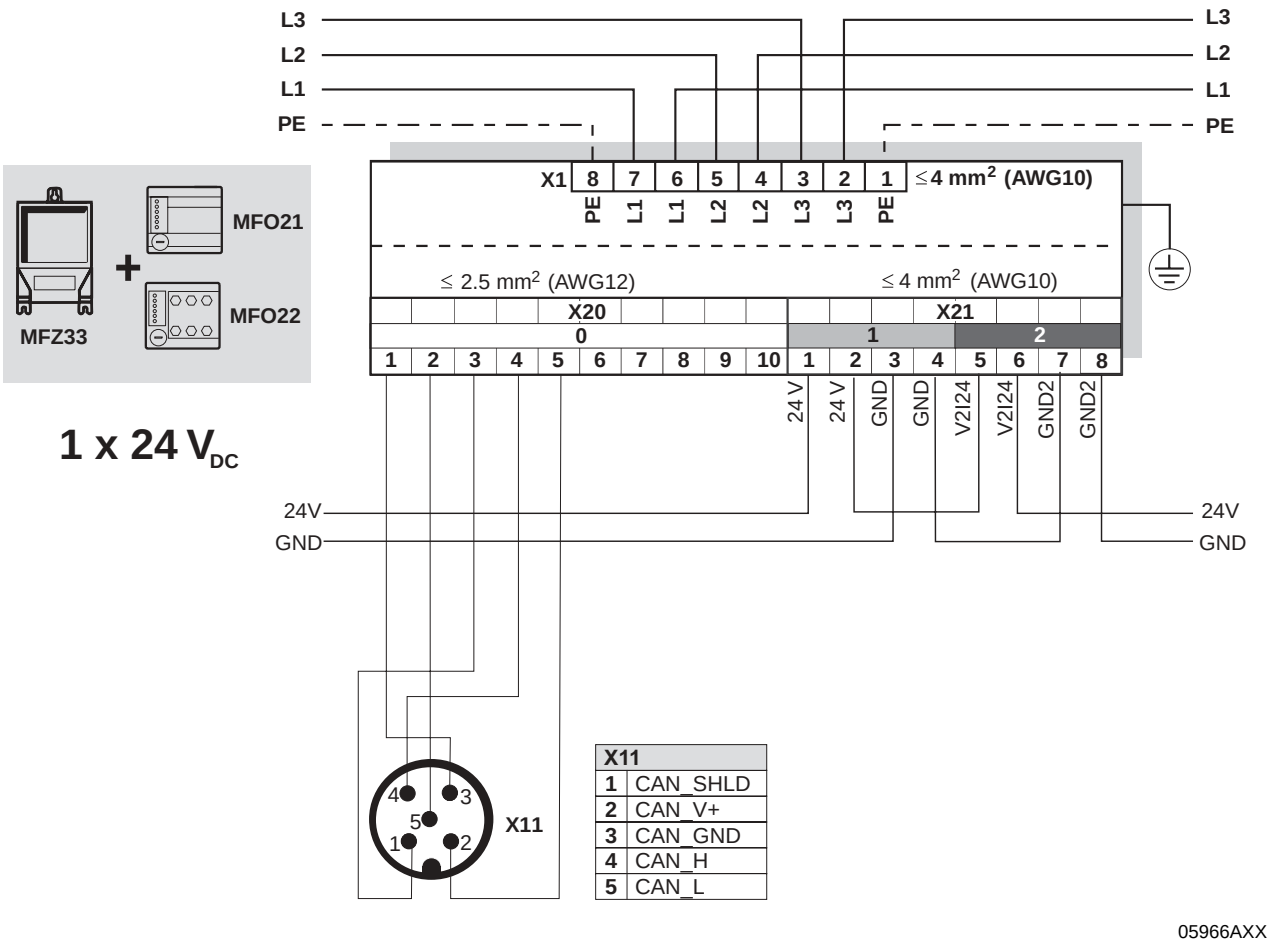
MFZ33 connection module with MFO21, MFO22 fieldbus module and two separate 24 V_{DC} voltage circuits



0 = Potential level 0 **1** = Potential level 1 2 = Potential level 2

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	CAN_GND	Input	CANopen reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	CAN_SHLD	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	CAN_V+	Input	CANopen voltage supply 24 V
	6-10	-	-	Reserved
X21	**1**	24 V	Input	24 V voltage supply for module electronics, sensors and MOVIMOT®
	2	24 V	Output	24 V voltage supply (jumpered with terminal X21/1)
	3	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	4	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	5	V2I24	Input	24 V voltage supply for actuators (digital outputs)
	6	V2I24	Output	24 V voltage supply for actuators (digital outputs) jumpered with terminal X21/5
	7	GND2	-	0V24V reference potential for actuators
	8	GND2	-	0V24V reference potential for actuators

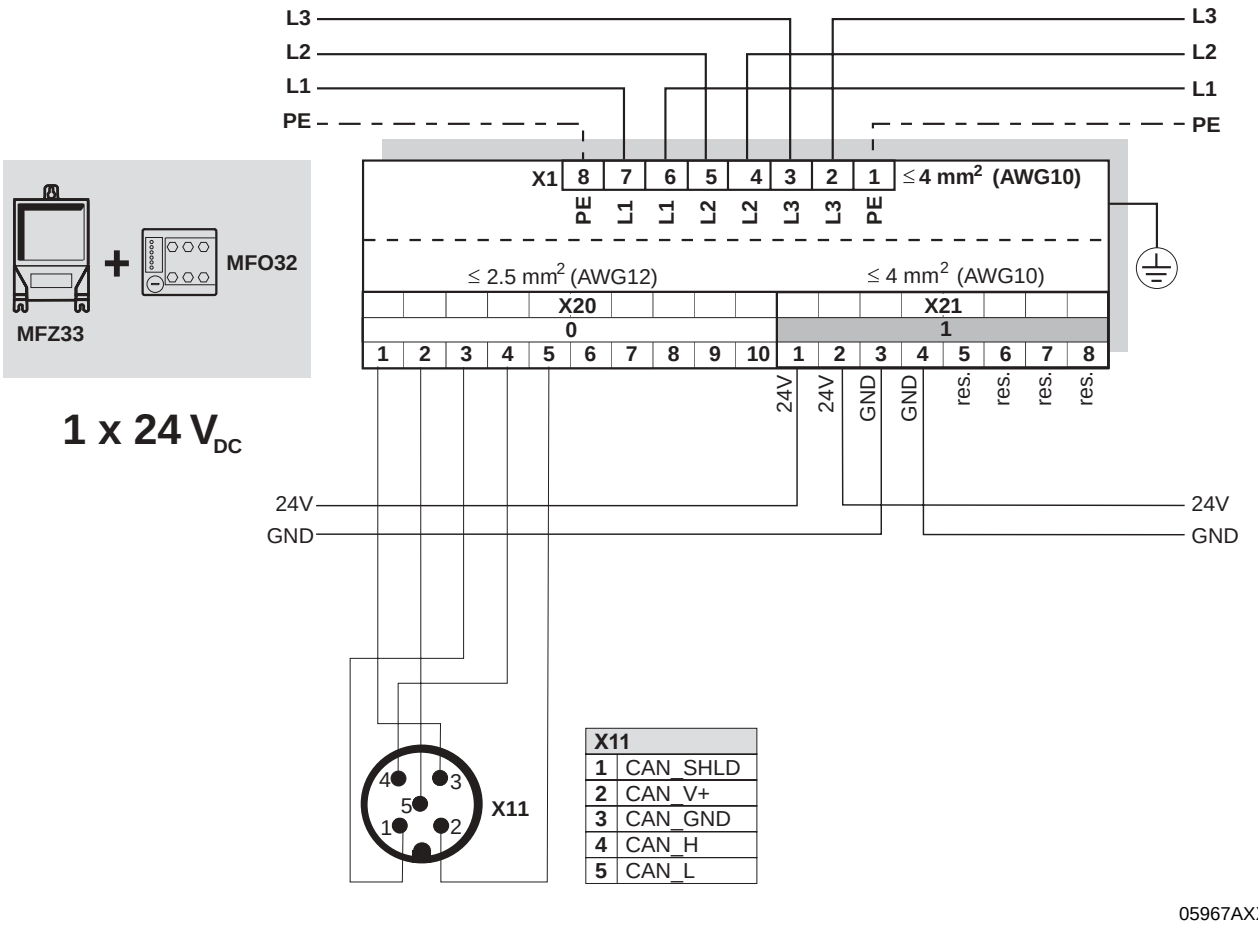
MFZ33 connection module with MFO21, MFO22 fieldbus module and one common 24 V_{DC} voltage circuit



0 = Potential level 0 **1** = Potential level 1 2 = Potential level 2

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	CAN_GND	Input	CANopen reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	CAN_SHLD	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	CAN_V+	Input	CANopen voltage supply 24 V
	6-10	-	-	Reserved
X21	**1**	24 V	Input	24 V voltage supply for module electronics, sensors and MOVIMOT®
	2	24 V	Output	24 V voltage supply (jumpered with terminal X21/1)
	3	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	4	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	5	V2I24	Input	24 V voltage supply for actuators (digital outputs)
	6	V2I24	Output	24 V voltage supply for actuators (digital outputs) jumpered with terminal X21/5
	7	GND2	-	0V24V reference potential for actuators
	8	GND2	-	0V24V reference potential for actuators

MFZ33 connection module with MFO32 fieldbus module

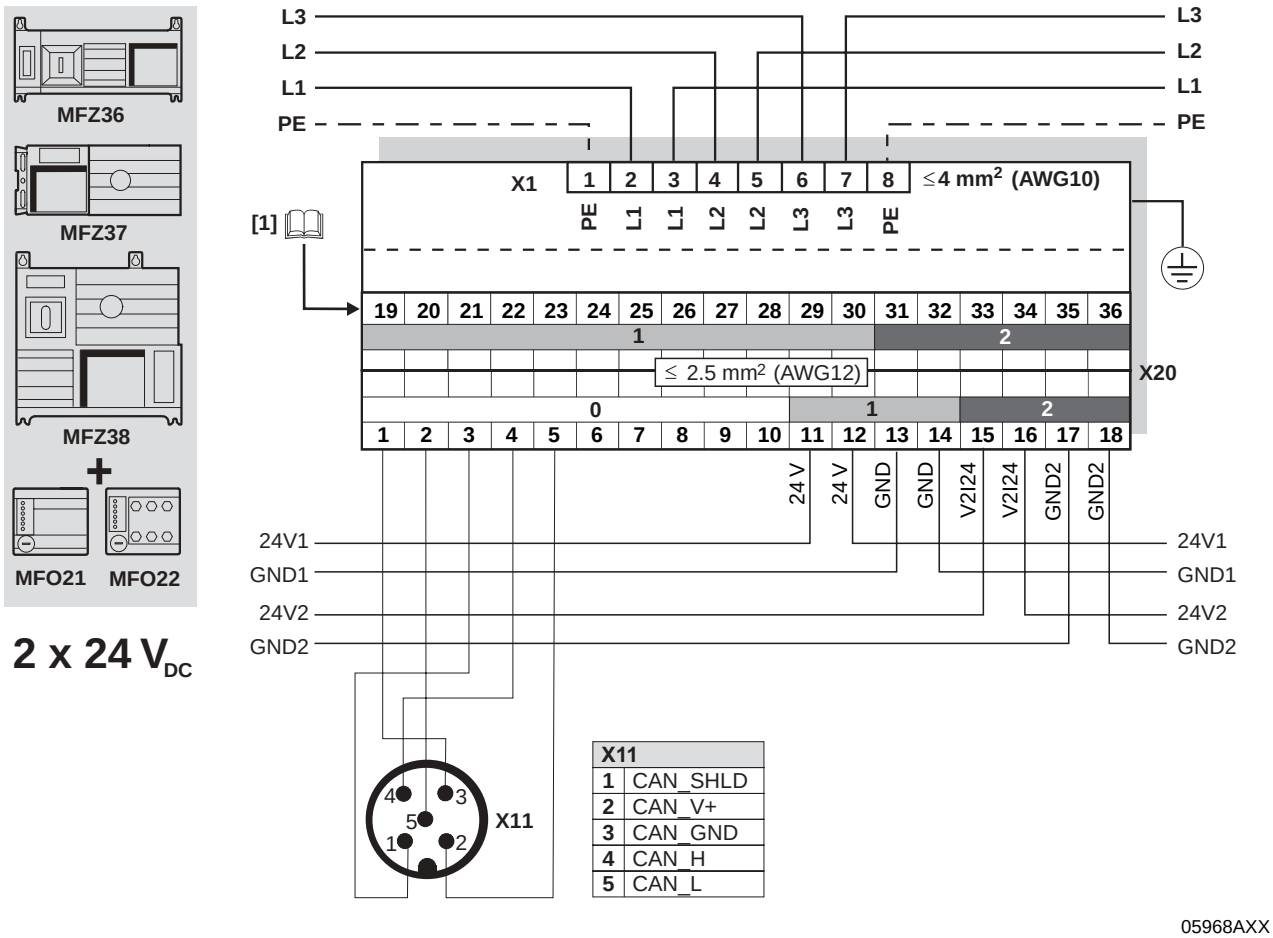


0 = Potential level 0 **1** = Potential level 1

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	CAN_GND	Input	CANopen reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	CAN_SHLD	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	CAN_V+	Input	CANopen voltage supply 24 V
	6-10	-	-	Reserved
X21	**1**	24 V	Input	24 V voltage supply for module electronics, sensors and MOVIMOT®
	2	24 V	Output	24 V voltage supply (jumpered with terminal X21/1)
	3	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	4	GND	-	0V24 reference potential for module electronics, sensors and MOVIMOT®
	5-8	-	-	Reserved

Connection of MFZ36, MFZ37, MFZ38 field distributors with MFO

MFZ36, MFZ37, MFZ38 connection modules with MFO21, MFO22 fieldbus module and two separate 24 V_{DC} voltage circuits



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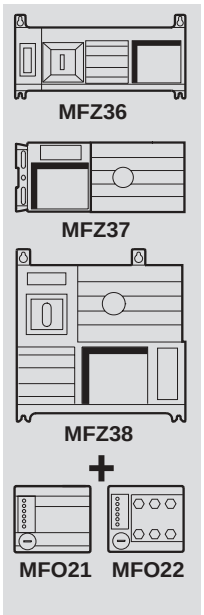
0 = Potential level 0 **1** = Potential level 1 2 = Potential level 2

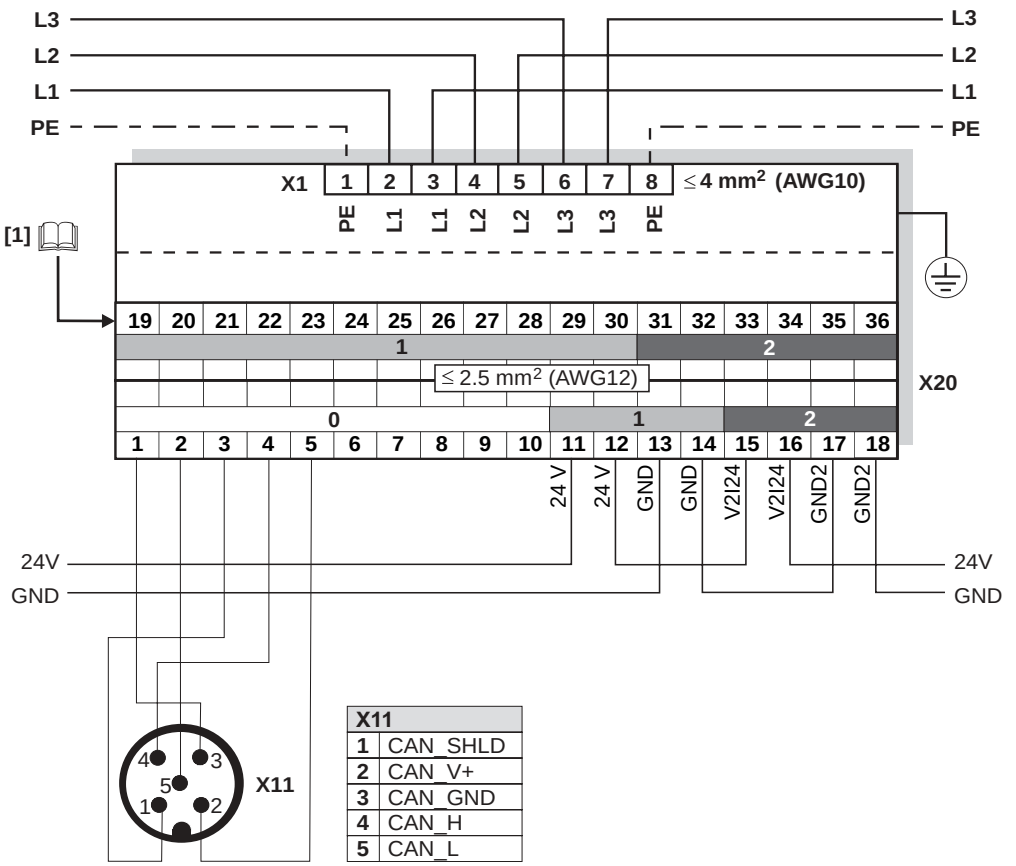
[1] Assignment of terminals 19-36 starting on page 55

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	CAN_GND	Input	CANopen reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	CAN_SHLD	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	CAN_V+	Input	CANopen voltage supply 24 V
	6-10	-	-	Reserved
	11	24 V	Input	24 V voltage supply for module electronics and sensors
	12	24 V	Output	24 V voltage supply (jumpered with terminal X20/11)
	13	GND	-	0V24 reference potential for module electronics and sensors
	14	GND	-	0V24 reference potential for module electronics and sensors
	15	V2I24	Input	24 V voltage supply for actuators (digital outputs)
	16	V2I24	Output	24 V voltage supply for actuators (digital outputs) jumpered with terminal X20/15
	17	GND2	-	0V24V reference potential for actuators
	18	GND2	-	0V24V reference potential for actuators

MFZ36, MFZ37, MFZ38 connection modules with MFO21, MFO22 fieldbus module and one common 24 V_{DC} voltage circuit:



1 x 24 V_{DC}

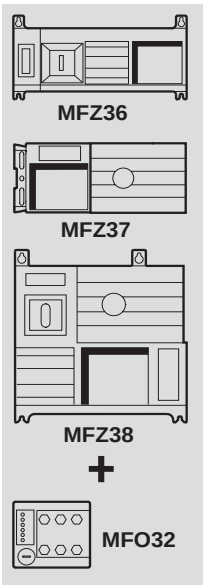


0 = Potential level 0 **1** = Potential level 1 2 = Potential level 2

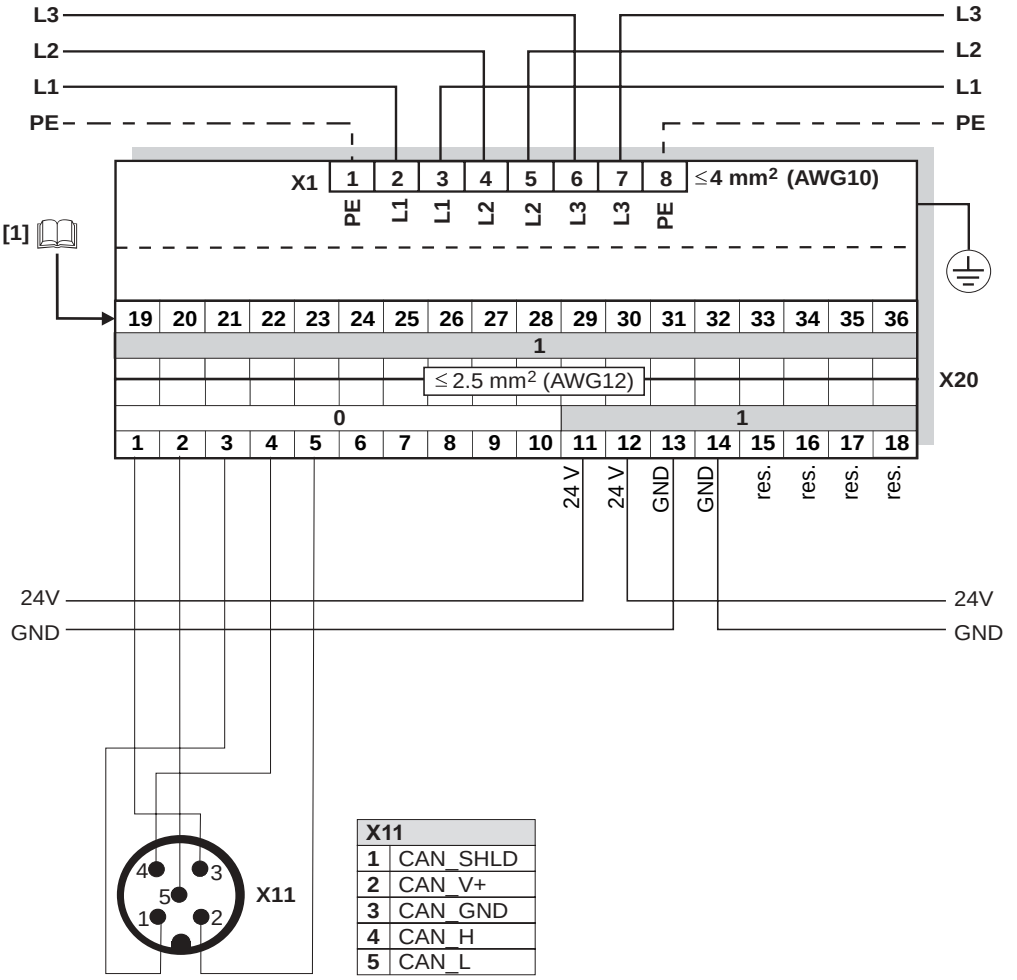
[1] Assignment of terminals 19-36 starting on page 55

Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	CAN_GND	Input	CANopen reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	CAN_SHLD	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	CAN_V+	Input	CANopen voltage supply 24 V
	6-10	-	-	Reserved
	11	24 V	Input	24 V voltage supply for module electronics and sensors
	12	24 V	Output	24 V voltage supply (jumpered with terminal X20/11)
	13	GND	-	0V24 reference potential for module electronics and sensors
	14	GND	-	0V24 reference potential for module electronics and sensors
	15	V2I24	Input	24 V voltage supply for actuators (digital outputs)
	16	V2I24	Output	24 V voltage supply for actuators (digital outputs) jumpered with terminal X20/15
	17	GND2	-	0V24V reference potential for actuators
	18	GND2	-	0V24V reference potential for actuators

MFZ36, MFZ37, MFZ38 connection modules with MFO32 fieldbus module



1 x 24 V_{DC}



X11	
1	CAN_SHLD
2	CAN_V+
3	CAN_GND
4	CAN_H
5	CAN_L

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0 = Potential level 0 **1** = Potential level 1

[1] Assignment of terminals 19-36 starting on page 55

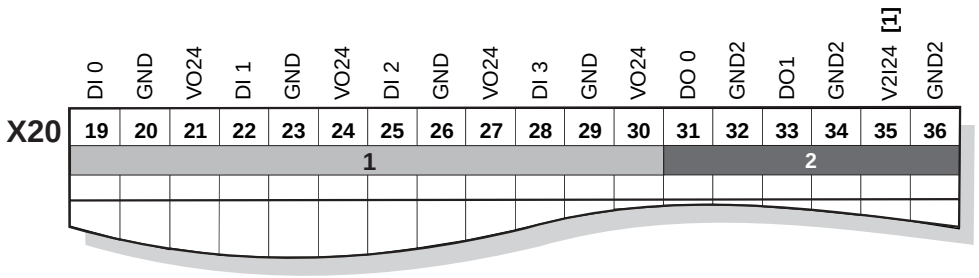
Terminal assignment				
No.		**Name**	**Direction**	**Function**
X20	**1**	CAN_GND	Input	CANopen reference potential 0V24
	2	CAN_L	Input/output	CAN_L data cable
	3	CAN_SHLD	Input	Equipotential bonding
	4	CAN_H	Input/output	CAN_H data cable
	5	CAN_V+	Input	CANopen voltage supply 24 V
	6-10	-	-	Reserved
	11	24 V	Input	24 V voltage supply for module electronics and sensors
	12	24 V	Output	24 V voltage supply (jumpered with terminal X20/11)
	13	GND	-	0V24 reference potential for module electronics and sensors
	14	GND	-	0V24 reference potential for module electronics and sensors
	15-18	-	-	Reserved

6.5 Connection of inputs / outputs (I/O) of MF../MQ.. fieldbus interfaces

Connection via terminals of..

fieldbus interfaces with four digital inputs and two digital outputs:

MFZ.1 **MFZ.6** **MFZ.7** **MFZ.8**	in combination with	**MF.21** **MF.22** **MF.23**	**MQ.21** **MQ.22**



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[1] MFI23 only: Reserved
all other MF.. modules: V2I24

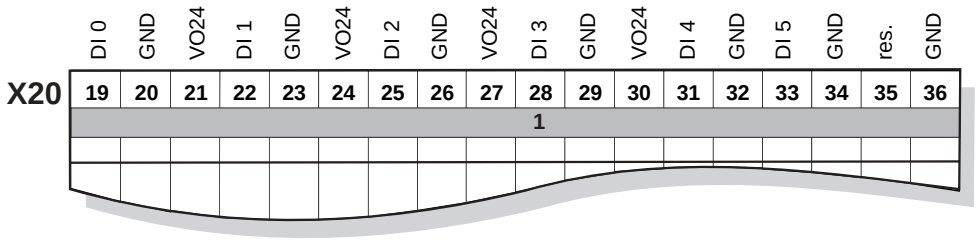
1	= Potential level 1
2	= Potential level 2

No.		Name	Direction	Function
X20	**19**	DI0	Input	Switching signal from sensor 1
	20	GND	-	0V24 reference potential for sensor 1
	21	V024	Output	24 V voltage supply for sensor 1
	22	DI1	Input	Switching signal from sensor 2
	23	GND	-	0V24 reference potential for sensor 2
	24	V024	Output	24 V voltage supply for sensor 2
	25	DI2	Input	Switching signal from sensor 3
	26	GND	-	0V24 reference potential for sensor 3
	27	V024	Output	24 V voltage supply for sensor 3
	28	DI3	Input	Switching signal from sensor 4
	29	GND	-	0V24 reference potential for sensor 4
	30	V024	Output	24 V voltage supply for sensor 4
	31	DO0	Output	Switching signal from actuator 1
	32	GND2	-	0V24 reference potential for actuator 1
	33	DO1	Output	Switching signal from actuator 2
	34	GND2	-	0V24 reference potential for actuator 2
	35	V2I24	Input	24 V voltage supply for actuators **only with MFI23: Reserved** **only with MFZ.6, MFZ.7 and MFZ.8: jumper at terminal 15 or 16**
	36	GND2	-	0V24 reference potential for actuators **only with MFZ.6, MFZ.7 and MFZ.8: jumper at terminal 17 or 18**

Connection via terminals of ...

fieldbus interfaces with six digital inputs:

MFZ.1 **MFZ.6** **MFZ.7** **MFZ.8**	in combination with	**MF.32** **MF.33**	**MQ.32**



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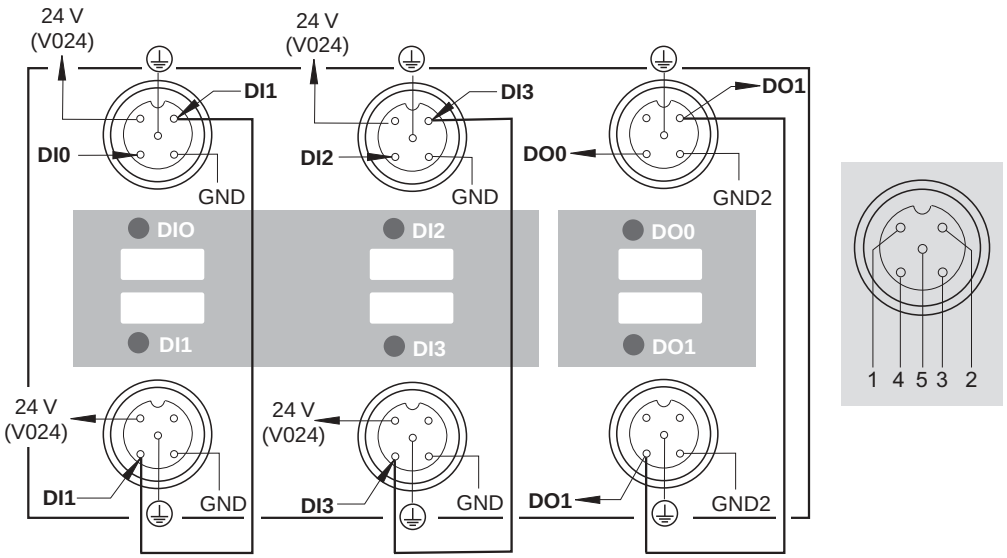
1 = Potential level 1

No.		Name	Direction	Function
X20	**19**	DI0	Input	Switching signal from sensor 1
	20	GND	-	0V24 reference potential for sensor 1
	21	V024	Output	24 V voltage supply for sensor 1
	22	DI1	Input	Switching signal from sensor 2
	23	GND	-	0V24 reference potential for sensor 2
	24	V024	Output	24 V voltage supply for sensor 2
	25	DI2	Input	Switching signal from sensor 3
	26	GND	-	0V24 reference potential for sensor 3
	27	V024	Output	24 V voltage supply for sensor 3
	28	DI3	Input	Switching signal from sensor 4
	29	GND	-	0V24 reference potential for sensor 4
	30	V024	Output	24 V voltage supply for sensor 4
	31	DI4	Input	Switching signal from sensor 5
	32	GND	-	0V24 reference potential for sensor 5
	33	DI5	Input	Switching signal from sensor 6
	34	GND	-	0V24 reference potential for sensor 6
	35	res.	-	Reserved
	36	GND	-	0V24 reference potential for sensors

Connection via M12 plug connector of...

MF.22, MQ.22, MF.23 fieldbus interfaces with four digital inputs and two digital outputs:

- Connect sensors/actuators either using M12 sockets or terminals.
- When using the outputs: Connect 24 V to V2I24 / GND2.
- Connect dual channel sensors/actuators to DI0, DI2 and DO0. DI1, DI3 and DO1 can then no longer be used.



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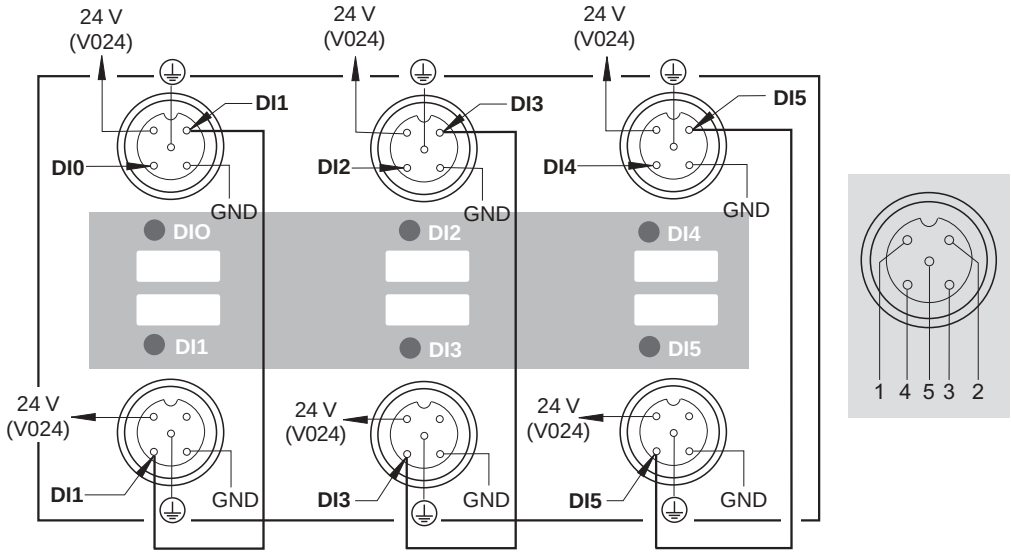
Important: Connections that are not in use must be covered with M12 closing caps to guarantee enclosure IP 65!

Connection via M12 plug connector of...

MF.32, MQ.32, MF.33 fieldbus interfaces with six digital inputs:

- Connect sensors either using M12 sockets or terminals.
- Connect dual channel sensors to DI0, DI2 and DI4. DI1, DI3 and DI5 can then no longer be used.



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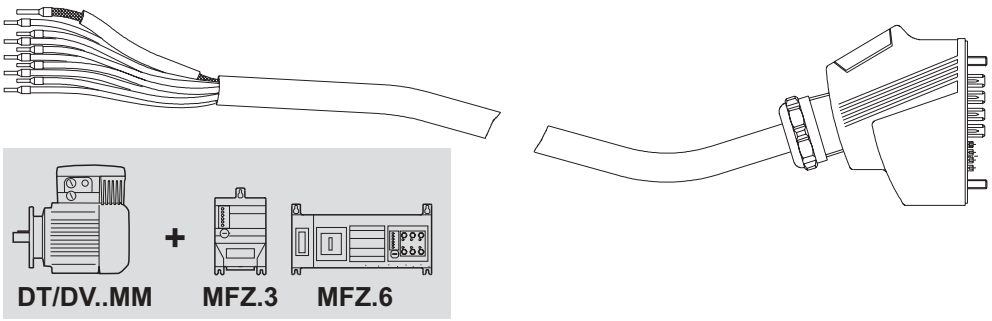
Important: Connections that are not in use must be covered with M12 closing caps to guarantee enclosure IP 65!

6.6 Connection of pre-fabricated cables

Connection of MFZ.3. or MFZ.6. field distributor and MOVIMOT® (part number 0186 725 3)



51246AXX

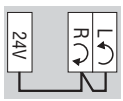
STOP

The outer shield of the cable must be attached to the housing of the MOVIMOT® terminal box using an EMC metal cable gland.

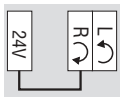
Cable assignment	
MOVIMOT® terminal	**Core color / designation**
L1	Black / L1
L2	Black / L2
L3	Black / L3
24 V	Red / 24 V
⊥	White / 0 V, white / 0 V
RS+	Orange / RS+
RS-	Green / RS-
PE terminal	Green-yellow + shield end

Note the enabled direction of rotation

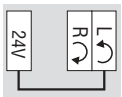
STOP



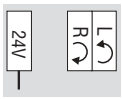
Both directions of rotation are enabled



Only clockwise direction of rotation is enabled
Setpoint selections for counterclockwise lead to the drive being stopped

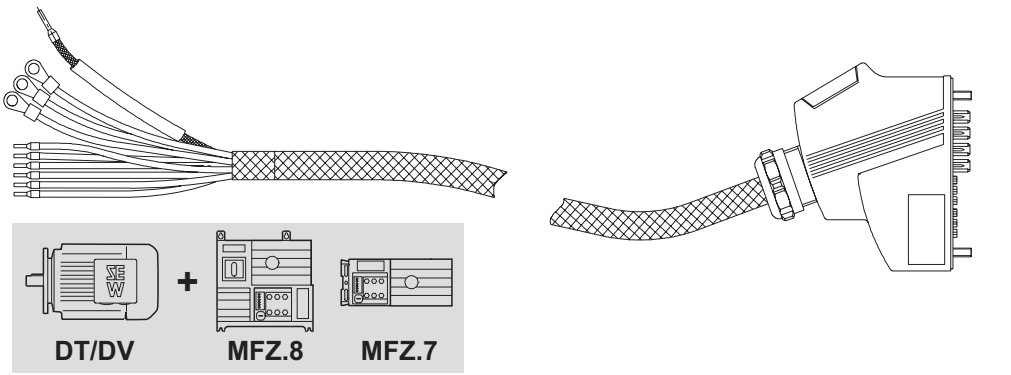


Only counterclockwise direction of rotation is enabled
Setpoint entries for clockwise rotation result in standstill of drive



Drive is blocked or brought to a stop

Connection of MFZ.3. or MFZ.8. field distributor and AC motors (part number 0186 742 3)



51245AXX

The outer shield of the cable must be attached to the housing of the MOVIMOT terminal box using an EMC metal cable gland.

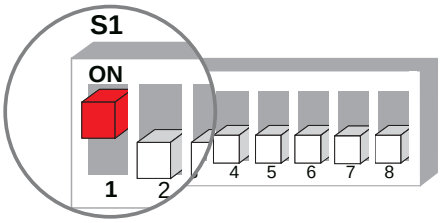
Cable assignment	
Motor terminal	**Core color / designation**
U1	Black / U1
V1	Black / V1
W1	Black / W1
13	Red / 13
14	White / 14
15	Blue / 15
TH	Black / 1
TH	Black / 2
PE terminal	Green-yellow + shield end (inside shield)

7 Startup with DeviceNet (MFD + MQD)

7.1 Startup procedure

- We recommend switching off the 24 V_{DC} power supply before removing/replacing the fieldbus interface (MFD/MQD)!
- The DeviceNet bus connection is permanently secured using the connection technology described on page 39, so that the DeviceNet operation can continue even after removal of the fieldbus interface.
- In addition, please observe the notes in the chapter "Supplemental Field Distributor Startup Information."

1. Verify correct connection of MOVIMOT® and DeviceNet connection module (MFZ31, MFZ33, MFZ36, MFZ37 or MFZ38).
2. Set DIP switch S1/1 (on MOVIMOT®) to ON (= address 1).



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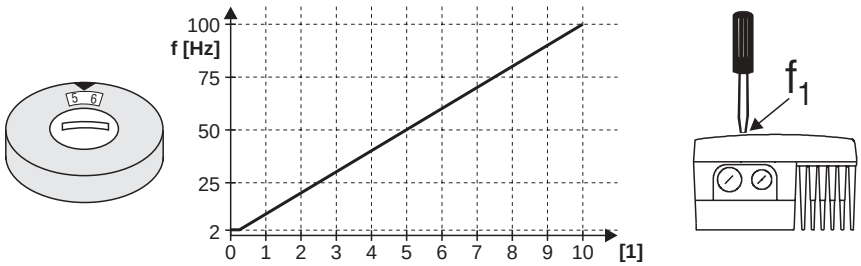
3. Set the maximum speed using f1 setpoint potentiometer (on MOVIMOT®).



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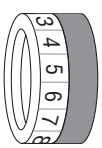
[1] Potentiometer setting

4. Re-insert screw plug of the cover (with gasket).
5. Set minimum frequency f_{min} with switch f2 (on MOVIMOT®).

Function	Setting										
Detent position	0	1	2	3	4	5	6	7	8	9	10
Min. frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

6. Set the required ramp time using switch t1 on MOVIMOT® if the ramp is not specified via fieldbus (2 PD). The ramp times are in relation to a setpoint step change of 50 Hz.

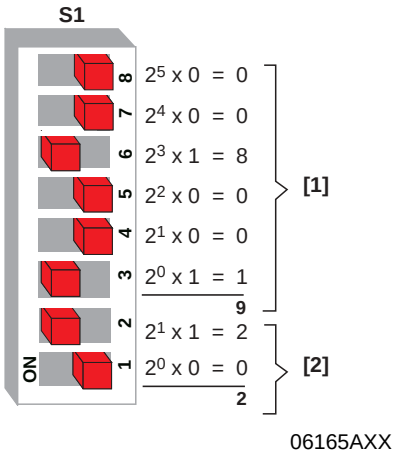


Function	Setting										
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.3	0.2	0.5	0.7	1	2	3	5	7	10

7. Set the DeviceNet address on the MFD/MQD module.
8. Connect the DeviceNet cable. Next, the LED test is performed. The Mod/Net LED must flash green and the SYS-F LED go out. The SYS-F-LED at the MQD goes out only if an IPOS program is running (delivery state).

7.2 Setting the DeviceNet address (MAC-ID) and baud rate

The baud rate is set using DIP switches S1/1 and S1/2. The DeviceNet address (MAC-ID) is carried out with DIP switches S1/3 to S1/8. The following illustration shows an example for setting the address and baud rate:



06165AXX

[1] Address (MAC-ID) (Setting: address 9)
Factory setting: Address 63
Valid addresses: 0 to 63

[2] Baud rate
Factory setting: 500 kbaud

Determining the DIP switch setting for any address

The following table uses address 9 as example to show how the DIP switch setting is determined and set for any bus address:

Calculation	Remainder	DIP switch setting	Significance
9/2 = 4	1	DIP S1/3 = ON	1
4/2 = 2	0	DIP S1/4 = OFF	2
2/2 = 1	0	DIP S1/5 = OFF	4
1/2 = 0	1	DIP S1/6 = ON	8
0/2 = 0	0	DIP S1/7 = OFF	16
0/2 = 0	0	DIP S1/8 = OFF	32

Setting the baud rate

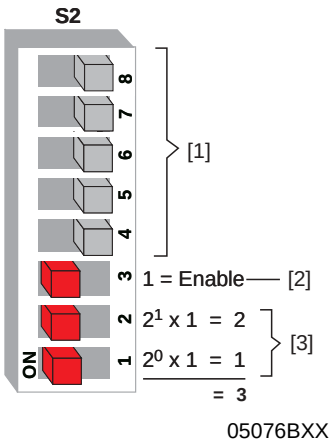
The following table shows how to set the baud rate via DIP switches S1/1 and S1/2:

Baud rate	Value	DIP S1/1	DIP S1/2
125 kbaud	0	OFF	OFF
250 kbaud	1	ON	OFF
500 kbaud	**2**	**OFF**	**ON**
(Reserved)	3	ON	ON

If an incorrect baud rate is specified (PIO LED flashes red), the device remains in the initialization state until a valid setting of the DIP switches is carried out (with MQD only).

7.3 Setting process data length and I/O enable (with MFD only)

The process data length is set via DIP switches S2/1 and S2/2 and the I/Os are enabled via DIP switch S2/3.



[1] Reserved (OFF position)
[2] I/O enable
Factory setting: Enable
[3] Process data length
Factory setting: 3 PD

The following table shows how to set the I/O enable using the DIP switch S2/3.

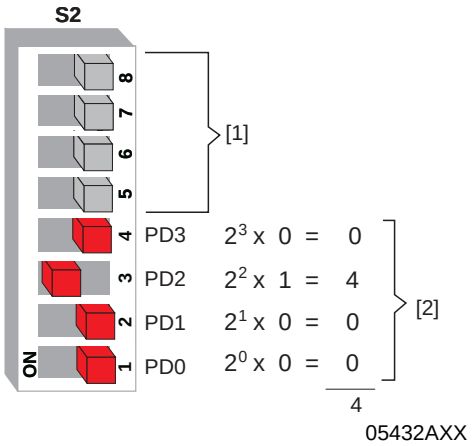
I/O	Value	DIP S2/3
Disabled	0	OFF
Enabled	**1**	**ON**

The following table shows how to set the process data length via DIP switches S2/1 and S2/2.

Process data length	Value	DIP S2/1	DIP S2/2
0 PD	0	OFF	OFF
1 PD	1	ON	OFF
2 PD	2	OFF	ON
3 PD	**3**	**ON**	**ON**

7.4 Setting the process data length (with MQD only)

The process data length is set with DIP switches S2/1 to S2/4.



[1] Reserved (OFF position)
[2] Process data length
Factory setting: 4 PD

The following table shows how to set the process data length via DIP switches S2/1 to S2/4.

Process data length	DIP S2/4 PD3	DIP S2/3 PD2	DIP S2/2 PD1	DIP S2/1 PD0
Reserved	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	**OFF**	**ON**	**OFF**	**OFF**
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
Reserved	All other switch settings			

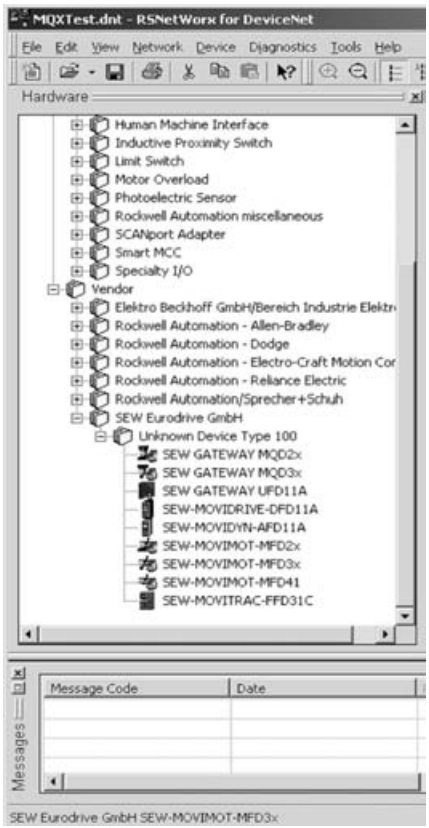
If an incorrect process data length is specified (BIO LED flashes red), the device remains in the initialization state until a valid setting of the DIP switches is carried out.

7.5 Configuration (project planning) for DeviceNet master

The configuration of the DeviceNet Master requires "EDS files." The "EDS files" are available in the Internet at http://www.sew-eurodrive.de. The files are installed using the configuration software (RSNetWorx). The exact installation procedure is described in the manuals of the corresponding configuration software.

Configuration (project planning) of MFD/MQD DeviceNet interface

1. Install the EDS file using the project planning software (RSNetWorx). The slave station can then be found in the folder "SEW-Eurodrive Profile" under one of the following names:
   - SEW-MOVIMOT-MFD2x
   - SEW-MOVIMOT-MFD3x
   - SEW Gateway MQD2x
   - SEW Gateway MQD3x
2. Create a new project or open an existing project and read in all network components using "Start Online Build."
3. Double click the symbol to configure the MFD/MQD interface. Next, read in the parameters of the module.
4. The MFD/MQD must be assigned a storage area for data exchange so that it can address the interface via controller. This can be accomplished using RSNetWorx. The documentation accompanying your configuration software contains detailed information.
5. Set the process data length and the I/Os using the configuration software.



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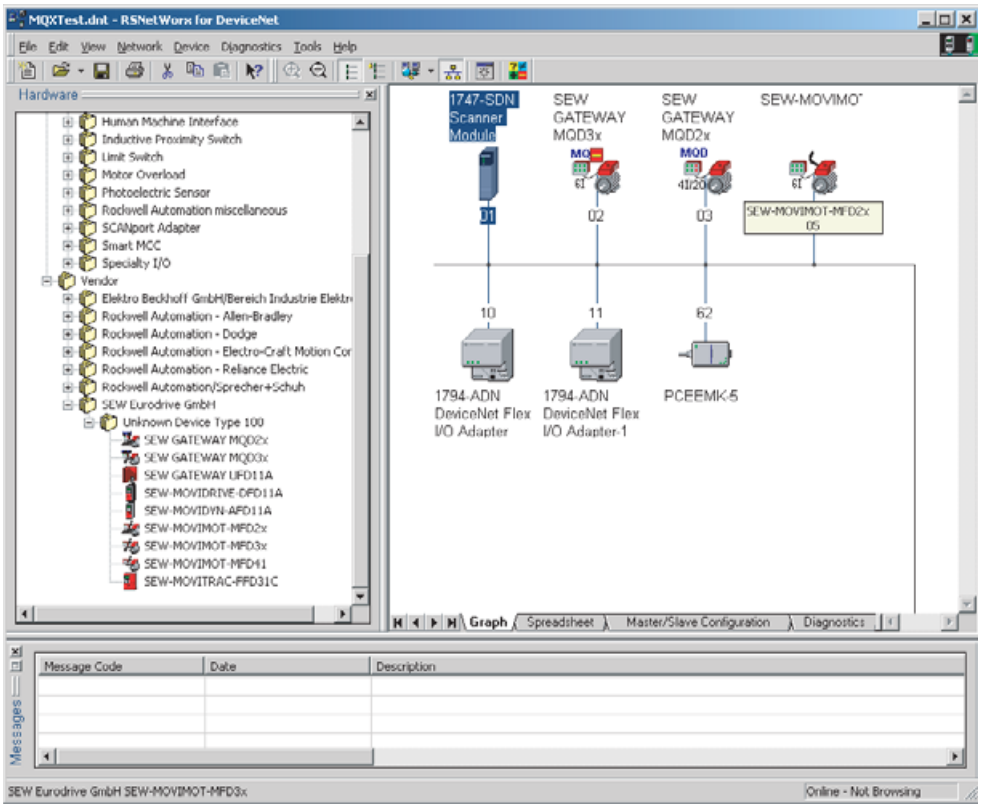
After downloading the configuration to the DeviceNet scanner (master), the MFD/MQD signals by means of the Mod/Net LED that a connection has been established with the master. The PIO and BIO LED indicate that the relevant process data connections have been established.

7.6 Network startup with RSNetWorx

The following illustration shows the RSNetWorx network manager.



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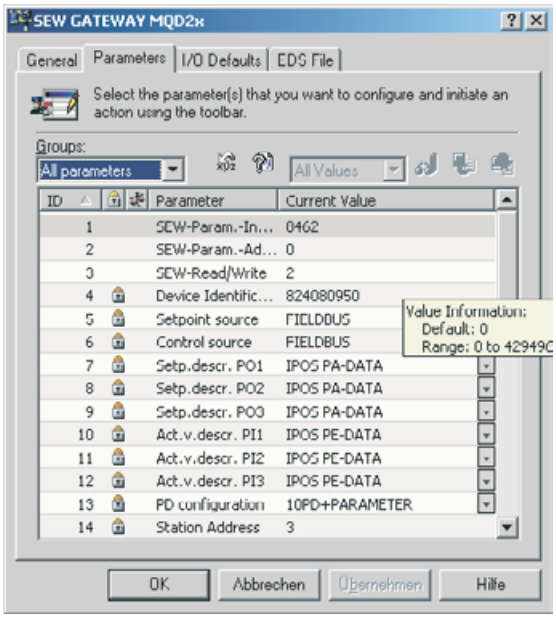
Adjusting parameters via RSNetWorx

The connected devices can be scanned with RSNetWorx network manager. Double-clicking the icon of the connected device (e.g. MQD2x) opens a diagnostics window which allows for monitoring important fieldbus parameters and the process data words. The specified process data length can be viewed in parameter 13.



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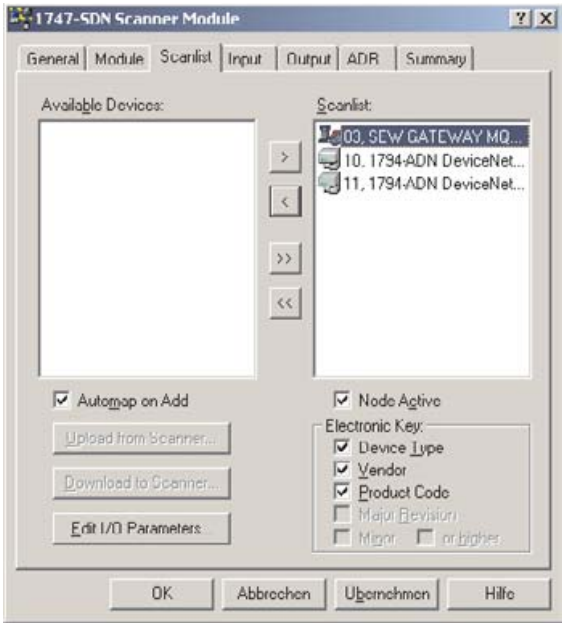
Starting the scanner

Next, the scanner must be started and the scan list (see the illustration below) must be generated. Open the startup window by double-clicking the scanner.



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Add the SEW fieldbus interface (e.g. SEW Gateway MQD2x) to the scan list.

Double-click the device in the scan list to set its PD length. The I/O parameter window opens. Set the process data length for the polled I/O and bit-strobe I/O connection. Note that the PD length is specified in bytes. For this reason, the PD length of the device must be multiplied by 2. Example: 10 PD requires a setting of 20 bytes.

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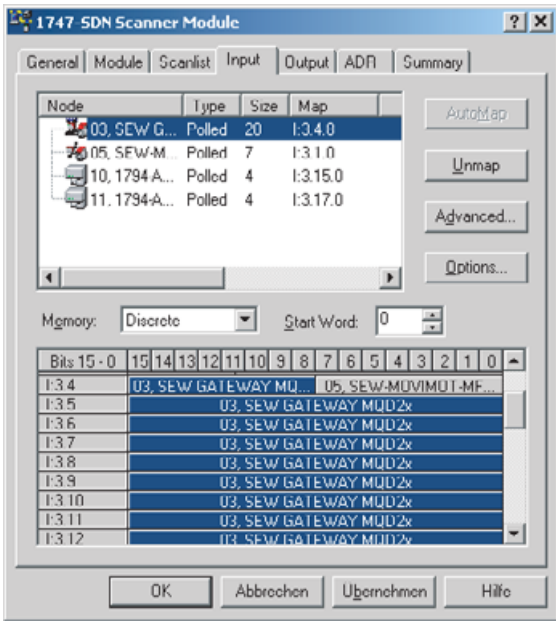
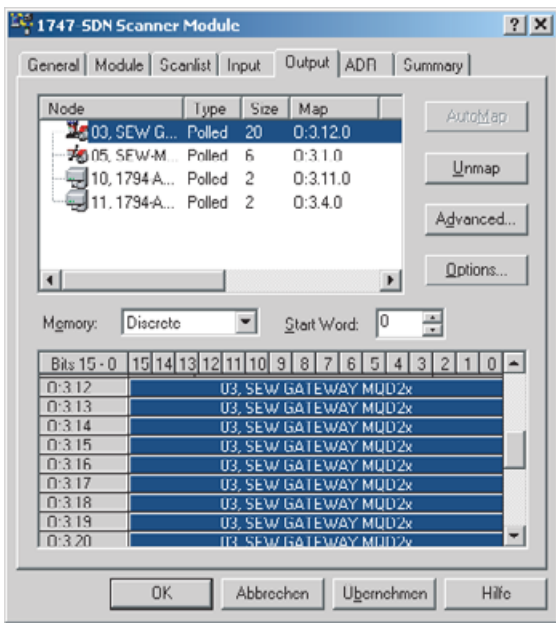
Creating the process data length

In the Input and Output tabs, the input/output data must be allocated to the PLC memory area. The allocation can be carried out via discrete I/O memory area or via M files (observe the description of the PLC).





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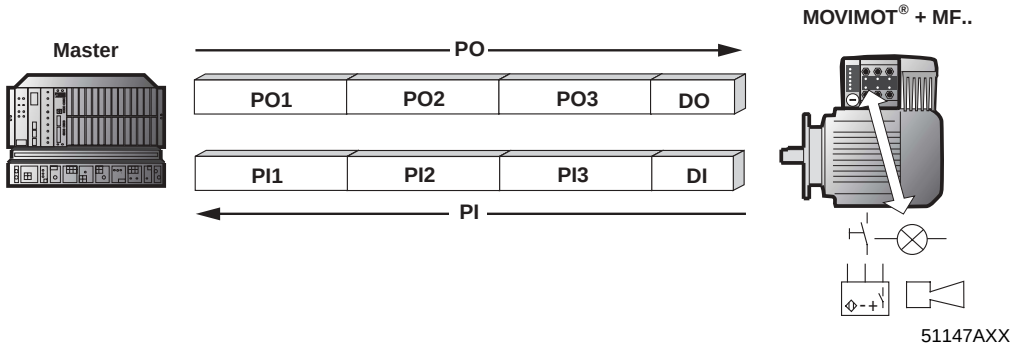
8 Function of the MFD DeviceNet Interface

8.1 Process data and sensor/actuator processing (Polled I/O = PIO)

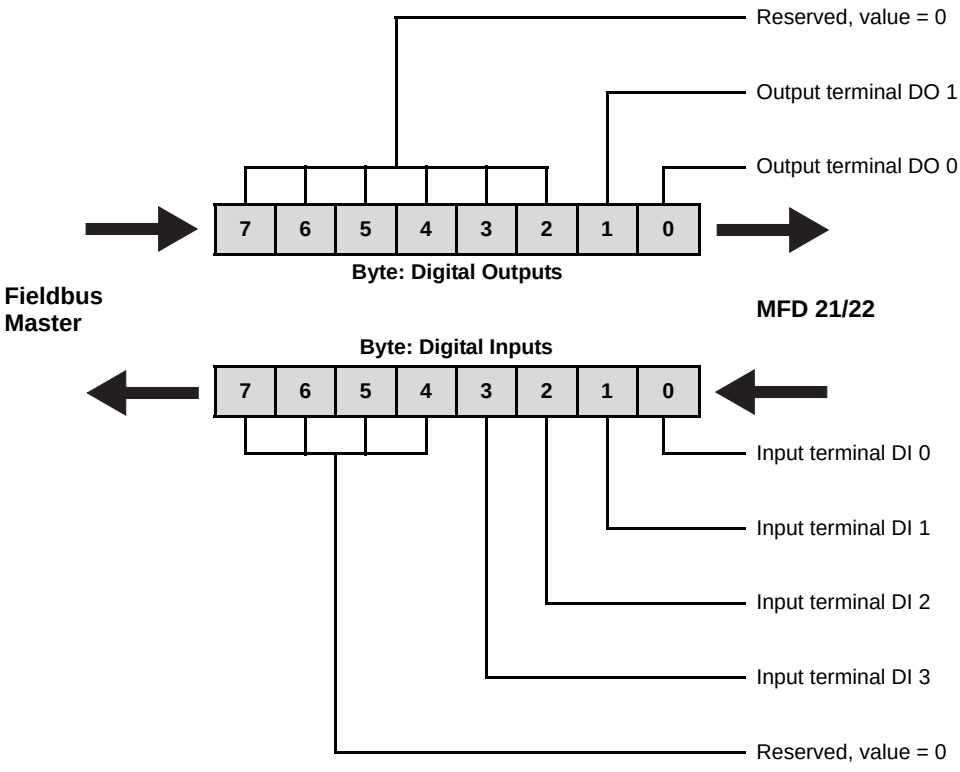
The MFD DeviceNet interface not only makes it possible to control MOVIMOT® AC motors but also permits connection of sensors/actuators to digital input terminals and digital output terminals. For this purpose, an additional I/O byte is added to the DeviceNet protocol following the process data for MOVIMOT®. The extra digital inputs and outputs of the MFD are reproduced in this I/O byte.

The process data are coded based on the uniform MOVILINK® profile for SEW drive inverters (see the chapter MOVILINK® Unit Profile).

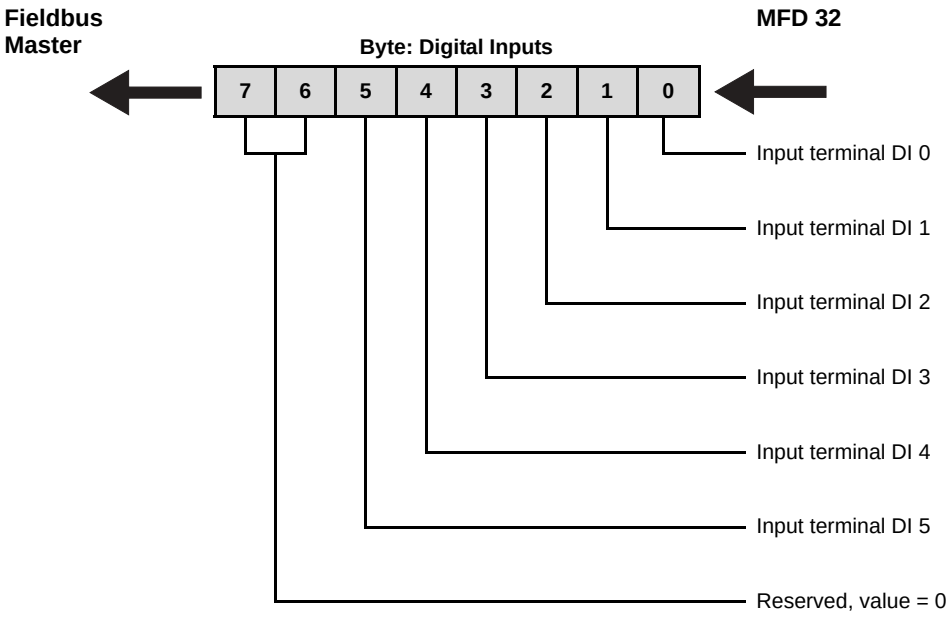


PO	Process output data	PI	Process input data
PO1	Control Word	PI1	Status word 1
PO2	Speed [%]	PI2	Output current
PO3	Ramp	PI3	Status word 2
DO	Digital outputs	DI	Digital inputs

8.2 Design of input/output byte (MFD 21/22)



8.3 Design of input/output byte (MFD 32)



8.4 Broadcast process data processing via bit strobe I/O (BIO)

Bit strobe I/O messages are not part of the SEW fieldbus profile. The messages represent a DeviceNet-specific process data exchange.

They involve a broadcast message being sent out by the master. The length of this broadcast message is 8 bytes = 64 bits. One bit in this message is assigned to each station in accordance with its station address. The value of this bit may be 0 or 1, triggering two different responses in the recipient.

Bit value	Message	BIO LED
0	Only send back the process input data	Green
1	Set process output data to 0 and send process input data	Green

Important:

If the process output data is set to 0 via a bit-strobe message, the ramp setpoint is set to 0.

Data area of the bit-strobe request telegram

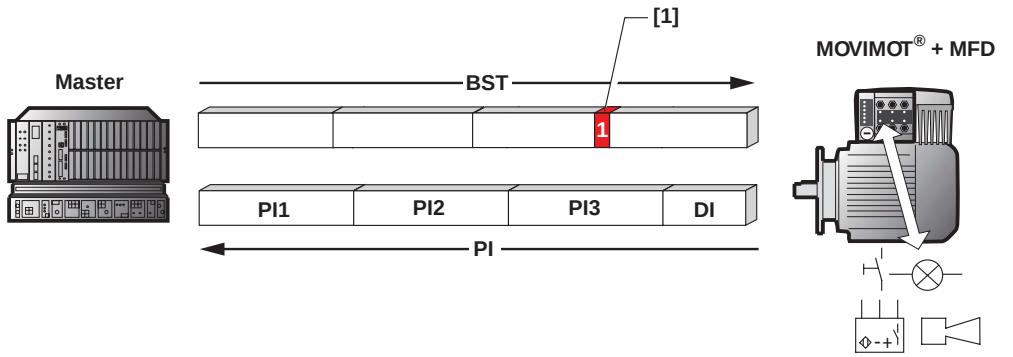
The following table shows the data area of the bit-strobe request telegram which represents the allocation of stations (= station address) to data bits.

For example, the station with station address (MAC-ID) 16, only processes bit 0 in data byte 2.

Byte offset	7	6	5	4	3	2	1	0
0	ID 7	ID 6	ID 5	ID 4	ID 3	ID 2	ID 1	ID 0
1	ID 15	ID 14	ID 13	ID 12	ID 11	ID 10	ID 9	ID 8
2	ID 23	ID 22	ID 21	ID 20	ID 19	ID 18	ID 17	**ID 16**
3	ID 31	ID 30	ID 29	ID 28	ID 27	ID 26	ID 25	ID 24
4	ID 39	ID 38	ID 37	ID 36	ID 35	ID 34	ID 33	ID 32
5	ID 47	ID 46	ID 45	ID 44	ID 43	ID 42	ID 41	ID 40
6	ID 55	ID 54	ID 53	ID 52	ID 51	ID 50	ID 49	ID 48
7	ID 63	ID 62	ID 61	ID 60	ID 59	ID 58	ID 57	ID 56

Exchange of bit-strobe I/Os

Each station that has received this bit-strobe I/O message responds with its current process input data and, if necessary, with the byte for the digital inputs. The length of the process input data corresponds to the process data length for the polled I/O connection plus, if necessary, a byte for the digital inputs. It can be set using DIP switches.



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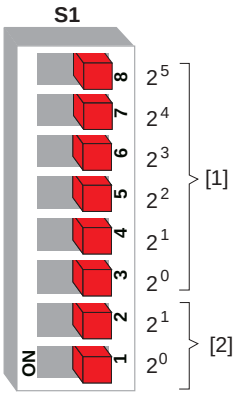
[1] Bit 16 for device with address 16

Important:

The set process data length influences the process data lengths of both the bit-strobe I/O and the polled I/O messages. This means the settings for the process data lengths of both the polled I/O and the bit-strobe I/O in the controller must be identical.

8.5 Functions of the DIP switches

Baud rate and address (MAC-ID) of the module can be set via DIP switch block S1.



[1] Address (MAC-ID)
[2] Baud rate

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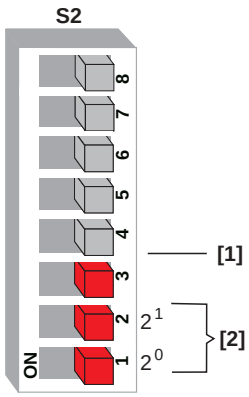
PD configuration The PD configuration on the MFD can be set via DIP switch block S2.



[1] I/O Enable
[2] Process data length

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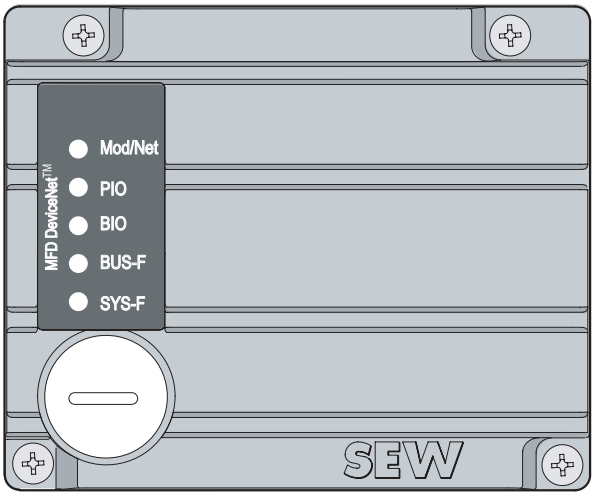
This results in the following PD configurations for the different MFD variants:

DIP switch setting	Supported MFD types	Description	Process output data length in byte (output size)	Process input data length in byte (input size)
2 PD	All MFD types	MOVIMOT® control via 2 process data words	4	4
3 PD	All MFD types	MOVIMOT® control via 3 process data words	6	6
0 PD + DI/DO	MFD 21/22	No MOVIMOT® control, only processing of digital inputs and outputs	1	1
2 PD + DI/DO	MFD 21/22	MOVIMOT® control via 2 process data words and processing of digital inputs and outputs	5	5
3 PD + DI/DO	MFD 21/22	MOVIMOT® control via 3 process data words and processing of digital inputs and outputs	7	7
0 PD + DI	MFD 32	No MOVIMOT® control, only processing of digital inputs	0	1
2 PD + DI	MFD 32	MOVIMOT® control via 2 process data words and processing of digital inputs	4	5
3 PD + DI	MFD 32	MOVIMOT® control via 3 process data words and processing of digital inputs	6	7

8.6 Meaning of the LED display

The DeviceNet interface MFD comprises five LEDs for diagnostic purposes:

- Mod/Net LED (green/red) for displaying the module and network status
- PIO LED (green/red) for displaying the status of the process data channel
- BIO LED (green/red) for displaying the status of the bit-strobe process data channel
- LED BUS-F (red) indicates the bus status
- LED SYS-F (red) indicates MFD or MOVIMOT® system errors



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Power-up

All LEDs are tested after the unit is switched on. The LEDs are switched on in the following sequence as part of the test:

Time	Mod/Net LED	PIO LED	BIO LED	BUS-F LED	SYS-F LED
0 ms	**Green**	Off	Off	Off	Off
250 ms	**Red**	Off	Off	Off	Off
500 ms	Off	**Green**	Off	Off	Off
750 ms	Off	**Red**	Off	Off	Off
1000 ms	Off	Off	**Green**	Off	Off
1250 ms	Off	Off	**Red**	Off	Off
1500 ms	Off	Off	Off	**Red**	Off
1750 ms	Off	Off	Off	Off	**Red**
2000 ms	Off	Off	Off	Off	Off

Afterwards, the unit checks whether a station with the same address (DUP-MAC check) has already been connected. If another station with the same address is found, the unit switches itself off and the Mod/Net, PIO and BIO LEDs are switched to a steady red light.

Mod/Net LED (green/red)

The range of functions of the Mod/Net LED (module/network status LED) is defined in the DeviceNet specification. The following table describes this functionality.

Status	LED	Message	Fault rectification
Not switched on / offline	Off	• Unit is offline • Unit is performing DUP-MAC check • Unit is switched off	• Switch on supply voltage via DeviceNet connector
Online and in operational mode	Flashes green (1 s cycle)	• DUP-MAC check was performed successfully • No connection has yet been established with a master • No configuration, wrong configuration or configuration not complete	• The station must be entered in the scan list of the master and the communication in the master must be started
Online, operational mode and connected	Green	• Online connection has been established with a master • Connection is active (established state)	–
Minor fault or connection timeout	Flashes red (1 s cycle)	• Polled I/O or/and bit-strobe I/O connections are in timeout status • A correctable error has occurred in the unit or in the bus system	• Check the DeviceNet cable • Check the timeout response; if a response with fault is defined, the unit must be reset after the fault is corrected
Critical fault or critical link failure	Red	• A non-correctable fault has occurred • BusOff • DUP-MAC check has detected a fault	• Check the DeviceNet cable • Check the address (MACID) (is address in use by another unit?)

PIO LED (green/red)

The PIO LED checks the polled I/O connection (process data channel). The functionality is described in the following table.

Status	LED	Message	
DUP-MAC check	Flashes green (125 ms cycle)	• Unit is performing the DUP-MAC check	• If the station does not leave this state after approx. 2 s, no additional stations were found. • At least one additional DeviceNet station must be switched on.
Not switched on / Offline but not DUP-MAC check	Off	• Unit is offline • Unit is switched off	• This connection type was not activated. • The connection must be switched on in the master.
Online and in operational mode	Flashes green (1 s cycle)	• Unit is online • DUP-MAC check was performed successfully • A PIO connection is being established with a master (configuring status) • No configuration, wrong configuration or configuration not complete	• The current station was recognized by the master, but it expected a different unit type. • Repeat the configuration in the master.
Online, operational mode and connected	Green	• Online • A PIO connection has been established (established status)	–
Minor fault or connection timeout	Flashes red (1 s cycle)	• A correctable fault has occurred • Polled I/O connection is in timeout status	• Check the DeviceNet cable • Check the timeout response (P831); if a response with fault is defined, the unit must be reset after the fault is corrected
Critical fault or critical link failure	Red	• A non-correctable fault has occurred • BusOff • DUP-MAC check has detected a fault	• Check the DeviceNet cable • Check the address (MACID) (is address in use by another unit?)

BIO LED (green/red)

The BIO LED checks the bit-strobe I/O connection. The functionality is described in the following table.

Status	LED	Message	Fault rectification
DUP-MAC check	Flashes green (125 ms cycle)	• Unit is performing DUP-MAC check	• If the station does not leave this state after approx. 2 s, no additional stations were found. • At least one additional DeviceNet station must be switched on.
Not switched on / Offline but not DUP-MAC check	Off	• Unit is offline • Unit is switched off	• This connection type was not activated. • The connection must be switched on in the master.
Online and in operational mode	Flashes green (1 s cycle)	• Unit is online • DUP-MAC check was performed successfully • A BIO connection is being established with a master (configuring status) • No configuration, wrong configuration or configuration not complete	• The current station was recognized by the master, but it expected a different unit type. • Repeat the configuration in the master.
Online, operational mode and connected	Green	• Online • A BIO connection has been established (established status)	–
Minor fault or connection timeout	Flashes red (1 s cycle)	• A correctable fault has occurred • Bit-strobe I/O connection is in timeout state	• Check the DeviceNet cable • Check the timeout response (P831); if a response with fault is defined, the unit must be reset after the fault is corrected
Critical fault or critical link failure	Red	• A non-correctable fault has occurred • BusOff • DUP-MAC check has detected a fault	• Check the DeviceNet cable • Check the address (MACID) (is address in use by another unit?)

BUS-F LED (red)

The BUS-F LED displays the physical status of the bus node. The functionality is described in the following table.

State	LED	Message	Error rectification
Error-Active state	Off	• The number of bus errors is in the normal range.	–
Error-Passive state	Flashes red (125 ms cycle)	• The unit is performing a DUP-MAC check and cannot send any messages because no other stations are connected to the bus.	• If no other stations are switched on, at least one station must be switched on.
Error-Passive state	Flashes red (1 s cycle)	• The number of physical bus errors is too high. • No more error messages are actively written to the bus.	• If this fault occurs during operation (i.e. with operational communication), the cabling and terminating resistors must be checked
BusOff state	Red	• The number of physical bus errors has continued to grow despite the switch to the error passive state. • Access to the bus is deactivated.	• Check the cabling, terminating resistors, baud rate and address (MACID)

SYS-F LED (red)

In general, the SYS-F LED has no functions in the PD configurations 0 PD + DI/DO and 0 PD + DI.

LED	Message	Fault rectification
Off	• Normal operating status of the MFD and MOVIMOT®	–
Flashes 1x	• MFD operating status OK, MOVIMOT® signals fault	• Evaluate the fault number in MOVIMOT® status word 1 in the controller. • Reset MOVIMOT® using the controller (reset bit in control word 1). • Read the MOVIMOT® operating instructions for additional information about fault correction.
Flashes 2x	• MOVIMOT® does not react to setpoints from the DeviceNet master because PD data have not been enabled.	• Check DIP switches S1/1 S1/4 on MOVIMOT®. • Set RS-485 address 1 to enable the PO data.
On	• Communication link between MFD and MOVIMOT® is disrupted or interrupted.	• Check the electrical connection between MFD and MOVIMOT® (terminals RS+ and RS-)
	• Maintenance switch on field distributor is set to OFF.	• Check the setting of the maintenance switch on the field distributor.

8.7 Fault states

MFD system fault/MOVIMOT® fault

The communications link between MFD and MOVIMOT® is interrupted if the MFD signals a system fault ("SYS-F" LED steady light). This system fault is signaled to the controller as fault code 91 $_{dec}$ via the diagnostics channel and via the status words of the process input data. **Since this system fault generally calls attention to cabling problems or a missing 24 V supply of the MOVIMOT® inverter, a RESET via control word is not possible! As soon as the communication link is reestablished, the fault automatically resets itself.** Check the electrical connection of MFD and MOVIMOT®. In the event of a system fault, the process input data return a fixed bit pattern because valid MOVIMOT® status information is no longer available. Consequently, it only remains possible to use the status word bit 5 (malfunction) and the fault code for evaluation within the controller. No other information is valid!

Process input word	Hex value	Message
PI1: Status word 1	$5B20_{hex}$	Fault code 91 ($5B_{hex}$), bit 5 (malfunction) = 1 No other status information is valid
PI2: Current actual value	0000_{hex}	Information is invalid
PI3: Status word 2	0020_{hex}	Bit 5 (malfunction) = 1 No other status information is valid
Input byte of the digital inputs	XX_{hex}	The input information of the digital inputs continues to be updated.

The input information of the digital inputs continues to be updated for evaluation within the controller.

DeviceNet timeout

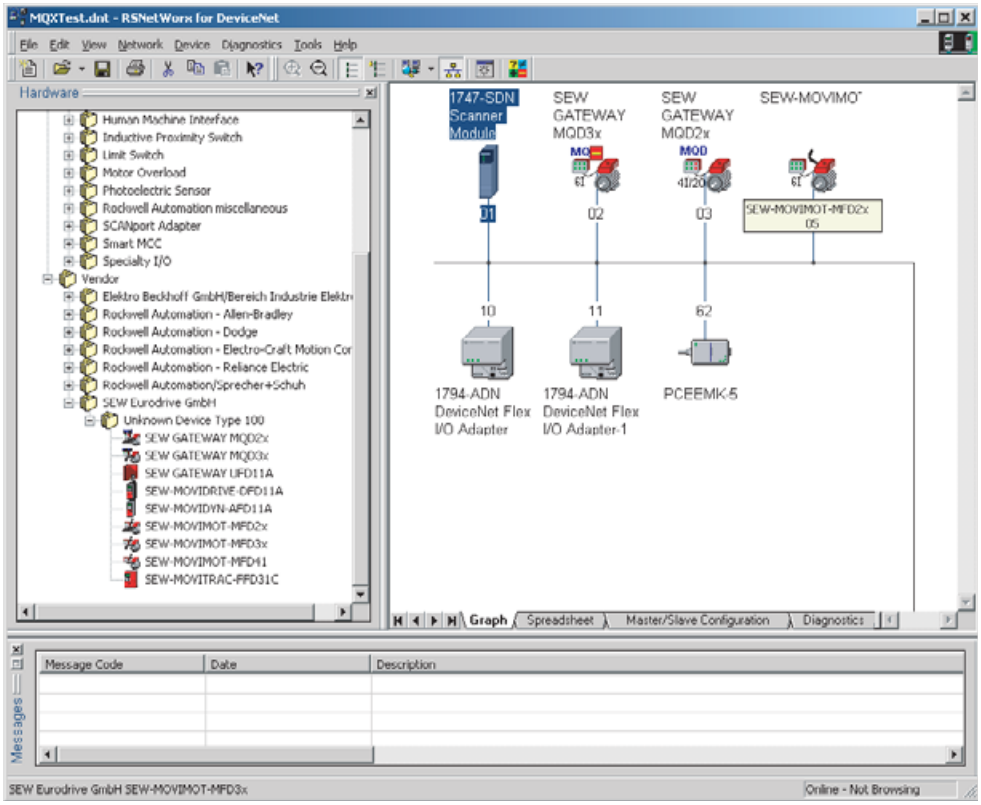
The timeout is triggered by the DeviceNet option card. The timeout interval is set by the master after the connection has been established. The DeviceNet specification refers to an expected packet rate rather than a timeout interval in this case. The expected packet rate is calculated on the basis of the timeout interval using the following formula:

$$t_{Timeout\ interval} = 4 \times t_{Expected\_Packet\_Rate}$$

The expected packet rate can be set using the connection object class (0x05), attribute 0x09. The values range from 5 ms to 65,535 ms in increments of 5 ms (0 ms = switched off).

Diagnostics

The DeviceNet manager can be used for Allen-Bradley controllers or similar devices to perform bus diagnostics. A start online build is used to check whether all components can be reached using the bus.



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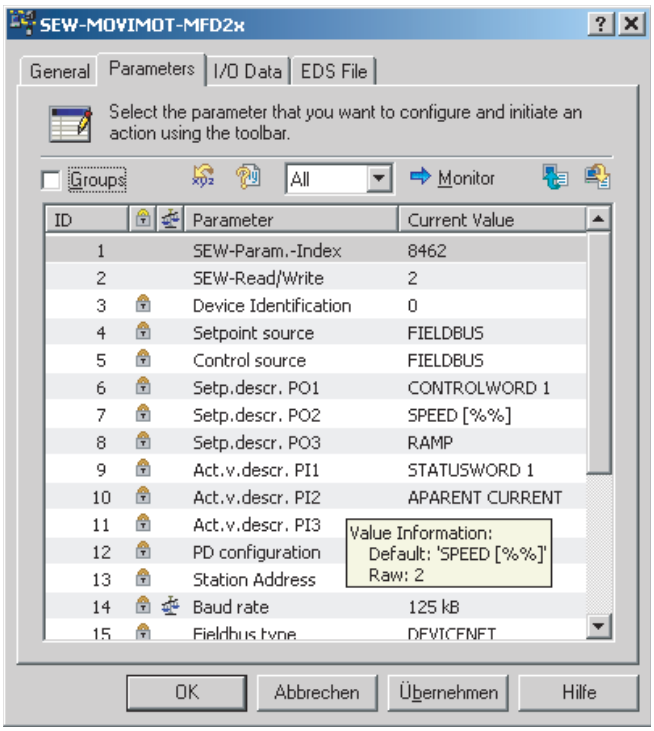
Double-clicking the MOVIMOT® MFD symbol displays the fieldbus parameters of the interface.



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9 Function of MQD DeviceNet Interface

Intelligent M**Q**D DeviceNet modules (as well as M**F**D modules) make for a convenient fieldbus connection of MOVIMOT® drives.

In addition, they are equipped with control functions which allow you to a large extent to self-determine the response of the drive to external input via fieldbus and integrated I/Os. This allows, for example, the processing of sensor signals directly at the fieldbus interface and allows the user to define his own unit profile via fieldbus interface. The use of the NV26 proximity sensor results in a single positioning system that can be integrated in your application in connection with an MQD control program.

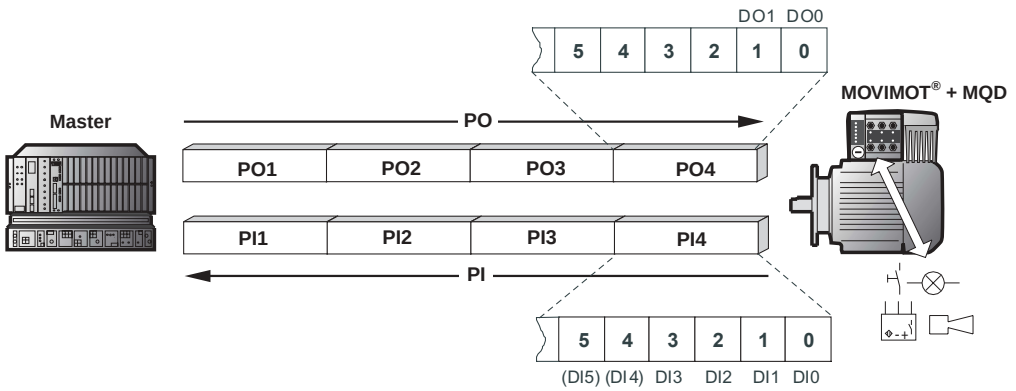
The control functions of the MQD modules is achieved by means of IPOS$^{plus®}$. The diagnostics and programming interface (under the fitting at the front) of the modules provides access to the integrated IPOS control. The UWS21A option allows for connecting to the serial interface of a PC. The programming is carried out via MOVITOOLS compiler or with LOGODrive.

Detailed information about programming can be found in the IPOS$^{plus®}$ or the LOGODrive manual.

9.1 Default program

The M**Q**D modules are delivered with an IPOS program as standard, which replicates the functions of the M**F**D modules to a large extent.

Adjust address 1 at MOVIMOT® and observe the instructions for startup. The process data width is 4 words fixed (to be taken into account for project planning/startup). The first 3 words are exchanged transparently with MOVIMOT® and correspond to the MOVILINK® unit profile. The I/Os of the MQD modules are transmitted in the fourth word.



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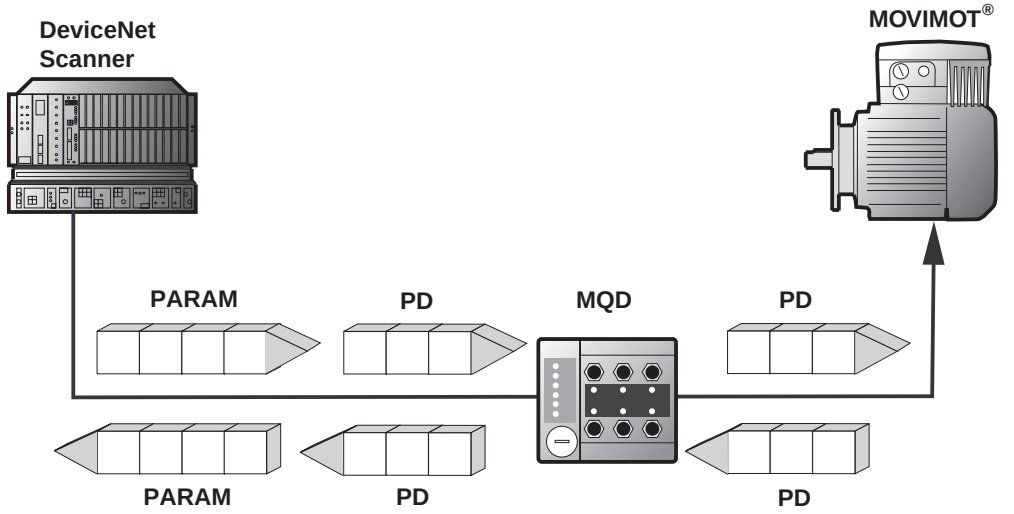
Fault response

An interruption of the connection between MQD module and MOVIMOT® leads to shutdown after 1 s. **The fault is displayed via status word 1 (Fault 91). Since this system fault usually indicates wiring problems or a missing 24V supply, you cannot perform a RESET via the control word! The error will be reset automatically once the communication link has been reestablished.** An interruption of the connection between fieldbus master and MQD module, following the adjusted fieldbus timeout interval, causes the process output data to MOVIMOT® to be set to 0. This fault response can be deactivated via parameter 831 of MOVITOOLS shell.

9.2 Configuration

The process data length must be specified at the MQD module via DIP switches to define type and number of input and output data used for the transmission. You can control the MQD via process data and read or write all MQD parameters via the parameter channel. The following figure shows a schematic view of the data exchange between controller (DeviceNet scanner), MQD DeviceNet interface (DeviceNet slave) and a MOVIMOT® with process data channel and parameter channel.



PARAM	Parameter data (Explicit messages)
PD	Process data (Polled I/O)

Process data configuration

The MQD DeviceNet interface lets you enter different process data configurations for the data exchange between DeviceNet scanner and MQD. The following table features information for all standard configurations. The "Process data configuration" column shows the name of the configuration.

The desired process data configuration must be selected via DIP switches. In addition, the configuration tool for the scanner (e.g. RSNetWorx) must be given the process data length in bytes.

The MQD processes these process data and, in the simplest case, sends the first three process data words to the assigned MOVIMOT®.

You set the MQD parameters with the parameter channel and execute it via explicit messages.

MQD accepts one to ten process data words.

Process data configuration	Meaning / information	DIP switch setting (hex)	Length of polled I/O in bytes
1 PD	Control via 1 process data word	1	2
2 PD	Control via 2 process data words	2	4
3 PD	Control via 3 process data words	3	6
4 PD	Control via 4 process data words	4	8
5 PD	Control via 5 process data words	5	10
6 PD	Control via 6 process data words	6	12
7 PD	Control via 7 process data words	7	14
8 PD	Control via 8 process data words	8	16
9 PD	Control via 9 process data words	9	18
10 PD	Control via 10 process data words	10	20

Data integrity

You will have to copy the values in the controller to a temporary area via copy block to exchange the data consistently.

9.3 Control via DeviceNet with polled I/O

The process output data sent by the DeviceNet scanner can be processed in the IPOS program of the MQD. The process input data sent to the DeviceNet scanner are specified by the IPOS program of the MQD.

The process data width can be freely adjusted from one to ten words.

The process data are stored in the direct I/O area or can be addressed via M files in case a PLC is used as DeviceNet scanner.

9.4 Idle mode of DeviceNet interface

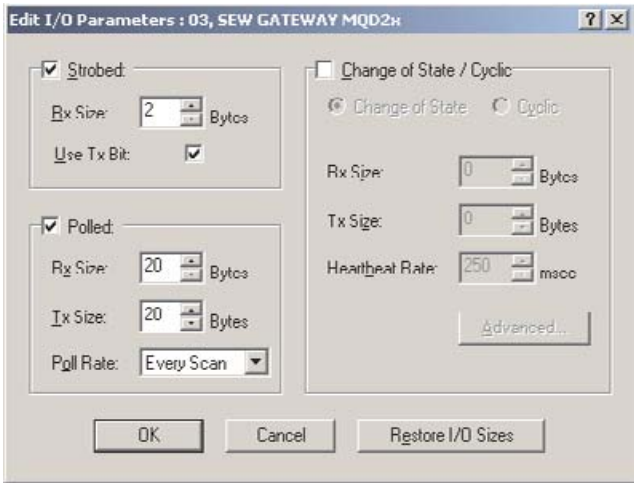
In idle mode, the process data are sent by the controller without contents. In this case, the process output data of the assigned MOVIMOT® are set to zero to ensure that the MOVIMOT® is stopped when the MQD goes into idle mode.

9.5 Status query via bit strobe I/O

The status of the MQD can cyclically be scanned via the bit strobe I/O. The length of the process input data for the bit strobe I/O is 2 bytes. The inverter status parameter (index 8310) is mapped to the process input data word by the MQD.

To activate the bit-strobe I/O, the strobe data must be activated in the I/O configuration and the length 2 RX bytes must be set.

Activating the bit strobe I/O



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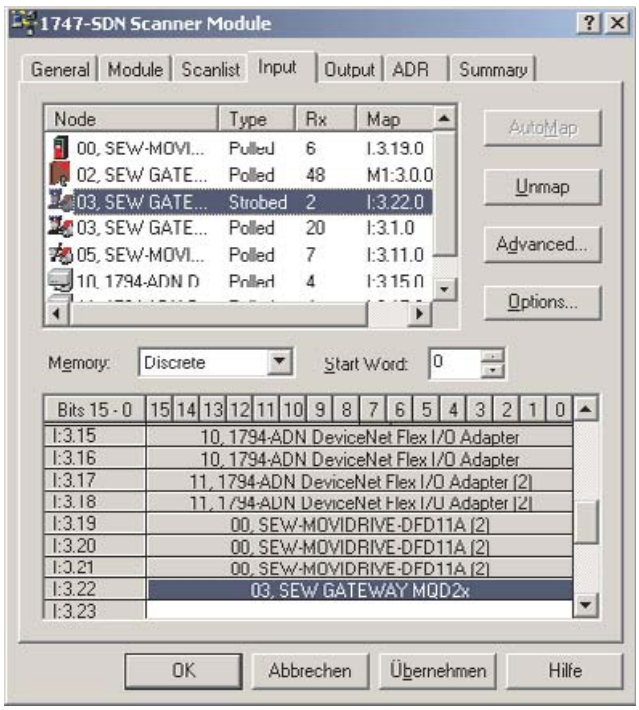
The 2 bytes in the INPUT data must then be mapped into the PLC memory. This step is carried out in the INPUT register of the scanner initialization window.

Mapping the bit strobe I/O



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9.6 Parameter setting via DeviceNet

MQD parameter setting via RSNet-Worx

All parameters of the MQD can be accessed via RSNetWorx project planning software.

In doing so, the parameters are divided into several groups:

Group	Meaning/function
SEW parameter channel	Access to all parameters via index and address
Device parameters	Direct access to MQD parameters and the MOVIMOT® connected via RS-485
MQD parameters	Direct access to the MQD parameters
PO monitor	Direct access to the process output data monitor
PI monitor	Direct access to the process input data monitor

SEW parameter channel

The SEW parameter channel includes the following access mechanism:

No.	Group	Parameter	Meaning/function
1	SEW parameter channel	SEW param. index	Index of the parameter used to read/write the data
2		SEW param. address	Address of the device from which the data is to be read/written Sub-address of MQD = 0
3		SEW read/write	Read/write data depending upon the address and index set above

Parameter setting procedure:

1. Set and download the index to be read/written.
2. Set and download the sub-address of the devices.
3. Set or read the data to be written.

Device parameters

All parameters directly connected with the fieldbus communication can be read directly via RSNetWorx. First, you set the address of the device from which the data is to be read (MQD sub-address = 0).

The parameters are listed in the following table (parameters that can only be read are designated with R = Read-Only in the No. column):

No.	Group	Name	Comments
2		SEW param. address	Address of the device from which the data is read/written (MQD sub-address = 0)
4R	Device parameters	Device identification	Device identification
5R	Device parameters	Setpoint source	Setpoint source
6R	Device parameters	Control source	Control signal source
7R	Device parameters	Setp.descr.PO1	Process output data Assignment for PO1
8R	Device parameters	Setp.descr.PO2	Process output data Assignment for PO2
9R	Device parameters	Setp.descr.PO3	Process output data Assignment for PO3
10R	Device parameters	Act.v.descr. PI1	Process input data Assignment for PI1
11R	Device parameters	Act.v.descr. PI2	Process input data Assignment for PI2
12R	Device parameters	Act.v.descr. PI3	Process input data Assignment for PI3
13R	Device parameters	PD Configuration	Process data configuration

MQD parameters

The parameters provided only for the MQD can be read with this group via RSNetWorx.

The parameters are listed in the following table (parameters that can only be read are designated with R = Read-Only in the No. column):

No.	Group	Name	Comments
14R	MQD parameters	Station address	Device address (MAC-ID)
15R	MQD parameters	Baud rate	DeviceNet baud rate
16R	MQD parameters	Fieldbus type	Fieldbus type
17R	MQD parameters	Timeout response	Timeout response

PO monitor

The process output data can be viewed using this group. First, you set the address of the device from which the data is to be read (MQD sub-address = 0).

The parameters are listed in the following table (parameters that can only be read are designated with R = Read-Only in the No. column):

No.	Group	Name	Comments
2		SEW param. address	Address of the device from which the data is read/written (MQD sub-address = 0)
19R	PO monitor	PO1 setpoint	Process data PO1
20R	PO monitor	PO2 setpoint	Process data PO2
21R	PO monitor	PO3 setpoint	Process data PO3
22R	PO monitor	PO4 setpoint	Process data PO4
23R	PO monitor	PO5 setpoint	Process data PO5
24R	PO monitor	PO6 setpoint	Process data PO6
25R	PO monitor	PO7 setpoint	Process data PO7
26R	PO monitor	PO8 setpoint	Process data PO8
27R	PO monitor	PO9 setpoint	Process data PO9
28R	PO monitor	PO10 setpoint	Process data PO10

PI monitor

The process input data can be viewed using this group. First, you set the address of the device from which the data is to be read (MQD sub-address = 0).

The parameters are listed in the following table (parameters that can only be read are designated with R = Read-Only in the No. column):

No.	Group	Name	Comments
2		SEW param. address	Address of the device from which the data is read/written (MQD sub-address = 0)
29R	PI monitor	PI1 setpoint	Process data PI1
30R	PI monitor	PI2 setpoint	Process data PI2
31R	PI monitor	PI3 setpoint	Process data PI3
32R	PI monitor	PI4 setpoint	Process data PI4
33R	PI monitor	PI5 setpoint	Process data PI5
34R	PI monitor	PI6 setpoint	Process data PI6
35R	PI monitor	PI7 setpoint	Process data PI7
36R	PI monitor	PI8 setpoint	Process data PI8
37R	PI monitor	PI9 setpoint	Process data PI9
38R	PI monitor	PI10 setpoint	Process data PI10

Exchanging explicit messages (parameter data) via register object

The register object can be used for direct access to all MQD parameters. For this purpose, an explicit message with the following structure must be transmitted:

Byte Offset	0	1	2	3	4	5	6	7	8	9	10	11
Function	MAC-ID	Service	Class	Instance	Attributes	Index		Data				Sub-address
Significance						Low	High	LSB			MSB	
Example	01h	10h	07h	02h	04h	70h	20h	09h	00h	00h	00h	00h

In this example (see table above), the parameter with the index 2070h = 8304 receives the value 9 = control word 1 from the MQD (address 0).

Service	Coding	Message
Get_Attribute_Single	0x0E	Read attribute
Set_Attribute_Single	0x10	Write attribute

9.7 Duplicate MAC-ID detection

A "Duplicate MAC-ID Check" is performed to ensure that all DeviceNet-compliant stations connected to the bus feature a different address.

This test is performed after power up and indicated via LEDs.

9.8 Return codes for parameter setting

If parameters are incorrectly adjusted, the MQD returns various return codes to the parameter setting master providing detailed information about the cause of the error.

These return codes are valid for all MQD communication interfaces.

Error code

The error code classifies the errors in different classes predetermined by the DeviceNet specification. Error code 1F designates the class of manufacturer-specific error codes.

Additional code

The additional code contains SEW-specific return codes for incorrect parameter setting of the MQD. They are returned to the master under error code 1F = "Manufacturer-specific error."

Error code: 1F = "Manufacturer-specific error"

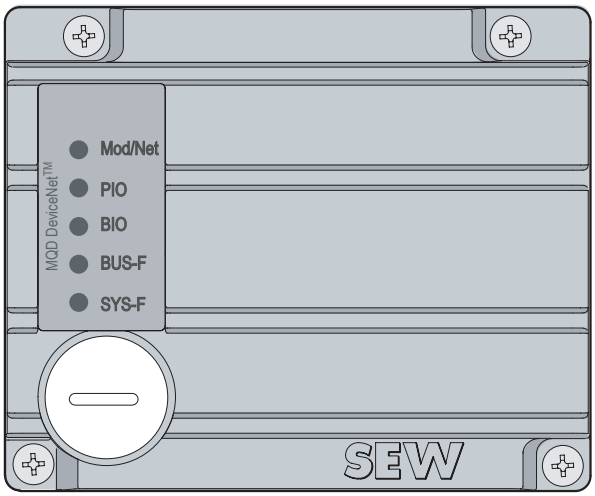
The following table shows all possible codings for the additional code.

Additional code low (hex)	Message
00	No fault
10	Invalid parameter index
11	Function/parameter not implemented
12	Read access only
13	Parameter lock is active
14	Factory setting is active
15	Value too large for parameter
16	Value too small for parameter
17	Option card required for this function/parameter is missing
18	Error in system software
19	Parameter access via RS-485 process interface on X13 only
1A	Parameter access via RS-485 diagnostics interface only
1B	Parameter has access protection
1C	Controller inhibit required
1D	Invalid value for parameter
1E	Factory setting was activated
1F	Parameter was not saved in EEPROM
20	Parameter cannot be changed with output stage enabled
21	UBP11A end string reached
22	UBP11A not cleared
23	Parameter may be changed at IPOS program stop only
24	Parameter may be changed with deactivated Autosetup only

9.9 Meaning of the LED display

The DeviceNet interface MQD comprises five LEDs for diagnostic purposes:

- "Mod/Net" LED (green/red) for displaying the module and network status
- "PIO" LED (green/red) indicates the status of the polled I/O connection
- "BIO" LED (green/red) indicates the status of the bit-strobe I/O connection
- "BUS-F" LED (red) indicates bus faults
- "SYS-F" LED (red) indicates system faults and operating states of the MQD



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Power-up

All LEDs are tested after the unit is switched on. The LEDs are switched on in the following sequence as part of the test:

Time	Mod/Net LED	PIO LED	BIO LED	BUS-F LED	SYS-F LED
0 ms	**Green**	Off	Off	Off	Off
250 ms	**Red**	Off	Off	Off	Off
500 ms	Off	**Green**	Off	Off	Off
750 ms	Off	**Red**	Off	Off	Off
1000 ms	Off	Off	**Green**	Off	Off
1250 ms	Off	Off	**Red**	Off	Off
1500 ms	Off	Off	Off	**Red**	Off
1750 ms	Off	Off	Off	Off	**Red**
2000 ms	Off	Off	Off	Off	Off

Afterwards, the unit checks whether a station with the same address (DUP-MAC check) has already been connected. If another station with the same address is found, the unit switches itself off and the Mod/Net, PIO and BIO LEDs are switched to a steady red light.

Mod/Net LED (green/red)

The range of functions of the Mod/Net LED (module/network status LED) is defined in the DeviceNet specification. The following table describes these functions.

Status	LED	Message	Fault rectification
Not switched on / offline	Off	• Unit is offline • Unit is performing DUP-MAC check • Unit is switched off	• Switch on supply voltage via DeviceNet connector
Online and in operational mode	Flashes green (1 s cycle)	• The unit is online and no connection has been established • DUP-MAC check was performed successfully • No connection has yet been established with a master • Missing (incorrect) or incomplete configuration	• The station must be entered in the scan list of the master and the communication in the master must be started
Online, operational mode and connected	Green	• Online connection has been established with a master • Connection is active (established state)	–
Minor fault or connection timeout	Flashes red (1 s cycle)	• A correctable fault has occurred • Polled I/O and/or bit-strobe I/O connections are in timeout state • A correctable fault has occurred in the unit	• Check the DeviceNet cable • Check the timeout response; if a response with fault is defined, the unit must be reset after the fault is corrected
Critical fault or critical link failure	Red	• A non-correctable fault has occurred • BusOff • DUP-MAC check has detected a fault	• Check the DeviceNet cable • Check the address (MACID) (is address in use by another unit?)

PIO LED (green/red)

The PIO LED checks the polled I/O connection (process data channel). The functions are described in the following table.

Status	LED	Message	Fault rectification
DUP-MAC check	Flashes green (125 ms cycle)	• Unit is performing DUP-MAC check	• If the station does not leave this state after approx. 2 s, no additional stations were found. • At least one additional DeviceNet station must be switched on.
Not switched on / Offline but not DUP-MAC check	Off	• Unit is offline • Unit is switched off	• This connection type was not activated. • The connection must be switched on in the master.
Online and in operational mode	Flashes green (1 s cycle)	• Unit is online • DUP-MAC check was performed successfully • A PIO connection is being established with a master (configuring state) • No configuration, wrong configuration or configuration not complete	• The current station was recognized by the master, but it expected a different unit type. • Repeat the configuration in the master.
Online, operational mode and connected	Green	• Online • A PIO connection has been established (established state)	–
Minor fault or connection timeout	Flashes red (1 s cycle)	• A correctable fault has occurred • Polled I/O connection is in timeout state	• Check the DeviceNet cable • Check timeout response (P831) • If a response with fault is defined, the unit must be reset after the fault is corrected
Critical fault or critical link failure	Red	• A non-correctable fault has occurred • BusOff • DUP-MAC check has detected a fault	• Check the DeviceNet cable • Check the address (MACID) (is address in use by another unit?)

BIO LED (green/red)

The BIO LED checks the bit strobe I/O connection. The functions are described in the following table.

Status	LED	Message	Fault rectification
DUP-MAC check	Flashes green (125 ms cycle)	• Unit is performing DUP-MAC check	• If the station does not leave this state after approx. 2 s, no additional stations were found. • At least one additional DeviceNet station must be switched on.
Not switched on / Offline but not DUP-MAC check	Off	• Unit is offline • Unit is switched off	• This connection type was not activated. • The connection must be switched on in the master.
Online and in operational mode	Flashes green (1 s cycle)	• Unit is online • DUP-MAC check was performed successfully • A BIO connection is being established with a master (configuring status) • No configuration, wrong configuration or configuration not complete	• The current station was recognized by the master, but it expected a different unit type. • Repeat the configuration in the master.
Online, operational mode and connected	Green	• Online • A BIO connection has been established (established state)	–
Minor fault or connection timeout	Flashes red (1 s cycle)	• A correctable fault has occurred • Bit strobe I/O connection is in timeout state	• Check the DeviceNet cable • Check the timeout response (P831); if a response with fault is defined, the unit must be reset after the fault is corrected
Critical fault or critical link failure	Red	• A non-correctable fault has occurred • BusOff • DUP-MAC check has detected a fault	• Check the DeviceNet cable • Check the address (MACID) (is address in use by another unit?)

BUS-F LED (red)

The BUS-F LED displays the physical state of the bus node. The functions are described in the following table.

Status	LED	Message	Fault rectification
Error active state	Off	• The number of bus faults is in the normal range (error active state)	–
DUP-MAC test	Flashes red (125 ms cycle)	• The unit is performing a DUP-MAC check and cannot send any messages because no other stations are connected to the bus (error passive state).	• If no other stations are switched on, at least one station must be switched on.
Error passive state	Flashes red (1 s cycle)	• The number of physical bus faults is too high. No more error messages are actively written to the bus (error passive state).	• If this fault occurs during operation (i.e. with operational communication), the cabling and terminating resistors must be checked
Bus off state	Red	• BusOff state • The number of physical bus faults has continued to grow despite the switch to the error passive state. Access to the bus is deactivated.	• Check the cabling, terminating resistors, baud rate and address (MACID)

SYS-F LED (red)

LED	Message	Fault rectification
Off	• Normal operating state • The MQD is exchanging data with the connected MOVIMOT®	–
Flashes regularly	• The MQD is in a fault state • A fault message is displayed in the MOVITOOLS status window	• Please observe the corresponding fault description (see the chapter "Fault Table").
On	• The MQD exchanges no data with the connected MOVIMOT®. • The MQD was not configured, or the connected MOVIMOT® do not respond.	• Check the wiring of the RS-485 between MQD and connected MOVIMOT® as well as the voltage supply of MOVIMOT® • Check whether the addresses set at the MOVIMOT® correspond to the addresses set in the IPOS program ("MovcommDef" command). • Check whether the IPOS program was started
	• Maintenance switch on field distributor is set to OFF.	• Check the setting of the maintenance switch on the field distributor.

9.10 Fault states

Fieldbus timeout

Switching off the fieldbus master or an open circuit of the fieldbus cabling leads to a fieldbus timeout at the MQD. The connected MOVIMOT® units are stopped by sending "0" in each process output data word. In addition, the digital outputs are set to "0."

It corresponds, for example, to a rapid stop on control word 1. **Caution: If the MOVIMOT® is controlled with three process data words, the ramp is specified with 0 s in the third word!**

The "Fieldbus timeout" fault resets itself automatically, i.e. after restart of the fieldbus communication the MOVIMOT® immediately receive the current process output data again from the controller.

This fault response can be deactivated via P831 of the MOVITOOLS shell.

RS-485 timeout

If one or several MOVIMOT® can no longer be addressed by the MQD via RS-485, error code 91 "System fault" is displayed in status word 1. As a result, the "SYS-F" LED illuminates. The fault is also transmitted via diagnostics interface.

MOVIMOT®, which do not receive any data, stop after 1 second. This requires that the data exchange between MQI and MOVIMOT® is carried out via MOVCOMM commands. MOVIMOT® that continue to receive data can be controlled as usual.

The timeout resets itself automatically, i.e. the current process data are immediately exchanged again with the unavailable MOVIMOT® after restart of the communication.

Unit fault

The MQD fieldbus interfaces can detect a series of hardware defects. After detecting a hardware defect, the devices are inhibited. The exact fault responses and removal measures can be found in the chapter "List of Faults."

A hardware defect causes fault 91 to be displayed in the process input data in status word 1 of all MOVIMOT®. As a result, the "SYS-F" LED on the MQD module flashes regularly.

The exact error code can be displayed via diagnostics interface in MOVITOOLS in the status of the MQD. In the IPOS program, the error code can be read and processed with the "GETSYS" command.

DeviceNet timeout

The timeout interval is set by the master after the connection has been established. The DeviceNet specification refers to an expected packet rate rather than a timeout interval in this case. The expected packet rate is calculated on the basis of the timeout interval using the following formula:

$$t_{\text{Timeout interval}} = 4 \times t_{\text{Expected\_Packet\_Rate}}$$

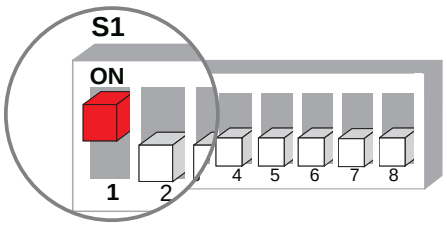
The expected packet rate can be set using the connection object class (0x05), attribute 0x09. The values range from 5 ms to 65,535 ms in increments of 5 ms (0 ms = switched off).

10 Startup with CANopen

10.1 Startup procedure

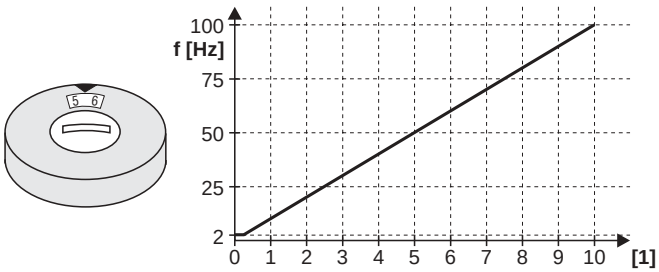
- We recommend switching off the 24 V_{DC} power supply before removing/replacing the fieldbus interface (MFO)!
- The CANopen bus connection is permanently secured using the connection technology described on page 47, so that the CANopen network operation can continue even after removal of the fieldbus interface.
- In addition, please observe the notes in the chapter "Supplemental Field Distributor Startup Information".

1. Verify correct connection of MOVIMOT® and connection module (MFZ31, MFZ33, MFZ36, MFZ37 or MFZ38).
2. Set DIP switch S1/1 (on MOVIMOT®) to ON (= address 1).



06164AXX

3. Set the maximum speed using f1 setpoint potentiometer (on MOVIMOT®).



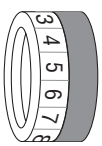
05066BXX

[1] Potentiometer setting

4. Re-insert screw plug of the cover (with gasket).
5. Set minimum frequency f_{min} with switch f2 (on MOVIMOT®).

Function	Setting										
Detent position	0	1	2	3	4	5	6	7	8	9	10
Min. frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

6. Set the required ramp time using switch t1 on MOVIMOT® if the ramp is not specified via fieldbus (2 PD). The ramp times are in relation to a setpoint step change of 50 Hz.

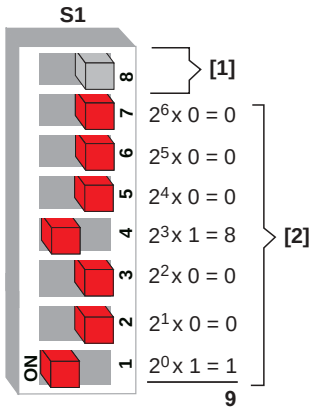


Function	Setting										
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.3	0.2	0.5	0.7	1	2	3	5	7	10

7. Set the CANopen address on the MFO module.
8. Connect the CANopen cable. After connecting 24 V_{DC}, the SYS-F LED must go out and the STATE LED must begin flashing.

10.2 Setting the CANopen address

The CANopen address is set using DIP switches S1/1 to S1/7.



51544AXX

[1] Reserved
[2] Address (set: address 9)
Factory setting: Address 1
Valid addresses: 1 to 127

Important: Module address 0 is not a valid CANopen address! If Address 0 is set, the interface cannot be operated. The LEDs COMM, GUARD and STATE flash simultaneously to indicate this fault (see also the chapter "Meaning of the LED display").

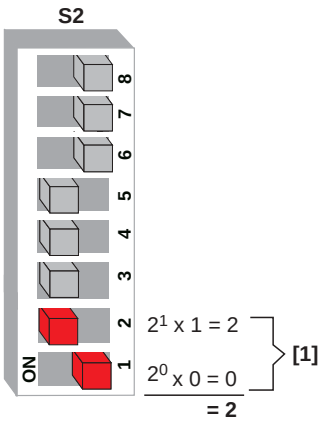
Determining the DIP switch setting for any address

The following table uses address 9 as an example to show how to determine the DIP switch settings for any bus address.

Calculation	Remainder	DIP switch setting	Significance
9/2 = 4	1	DIP 1 = ON	1
4/2 = 2	0	DIP 2 = OFF	2
2/2 = 1	0	DIP 3 = OFF	4
1/2 = 0	1	DIP 4 = ON	8
0/2 = 0	0	DIP 5 = OFF	16
0/2 = 0	0	DIP 6 = OFF	32
0/2 = 0	0	DIP 7 = OFF	64

10.3 Setting the CANopen baud rate

The baud rate is set using DIP switches S2/1 and S2/2. The following table shows how to determine the baud rate using the DIP switch assignment:



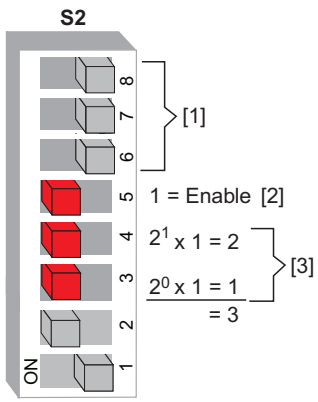
04989BXX

[1] CANopen baud rate
Factory setting: 500 kbaud

Baud rate	Value	DIP 1	DIP 2
125 kbaud	0	OFF	OFF
250 kbaud	1	ON	OFF
500 kbaud	**2**	**OFF**	**ON**
1 Mbaud	3	ON	ON

10.4 Setting process data length and I/O enable

The process data length is set via DIP switches S2/3 and S2/4 and the I/Os are enabled via DIP switch S2/5.



05972AXX

[1] Reserved, position = OFF
[2] I/O enable
Factory setting: Enable
[3] Process data length
Factory setting: 3 PD

The following table shows how to determine I/O enable using the DIP switch assignment:

I/O	Value	DIP 5
Disabled	0	OFF
Enabled	**1**	**ON**

The following table shows how to determine the process data length using the DIP switch assignment:

Process data length	Value	DIP 3	DIP 4
0 PD	0	OFF	OFF
Unacceptable configuration	1	ON	OFF
2 PD	2	OFF	ON
3 PD	**3**	**ON**	**ON**

10.5 Configuration (project planning) of CANopen master

"EDS files" are available for the configuration of the CANopen master. These files are installed by using the configuration software. The detailed installation procedure is described in the manuals of the corresponding configuration software. The most current version of the EDS files is available in the Internet at http://www.sew-eurodrive.de.

EDS file

An EDS file is available for every possible process data configuration. The name of the corresponding EDS file consists of the following:

- MXX_YPD.EDS or MXX_YPD**I**.EDS

The letter "I" indicates that the "Process Data I/O" DIP switch is switched on. The meaning of XX and Y can be found in the following table.

XX	Unit type
21	MFO21A
22	MFO22A
32	MFO32A

Y	Number of process data (as set with the DIP switch)
0	No process data
2	Control via 2 process data
3	Control via 3 process data

Examples:

Three process data words must be transferred to MOVIMOT® with the MFO22A fieldbus module. In addition, an I/O byte must be attached to the process data.

The name of the corresponding EDS file is:

- M22_3PDI.EDS

Three process data words must be transferred to MOVIMOT® with the MFO21A fieldbus module. The I/Os of the MFO21A must not be processed.

The name of the corresponding EDS file is:

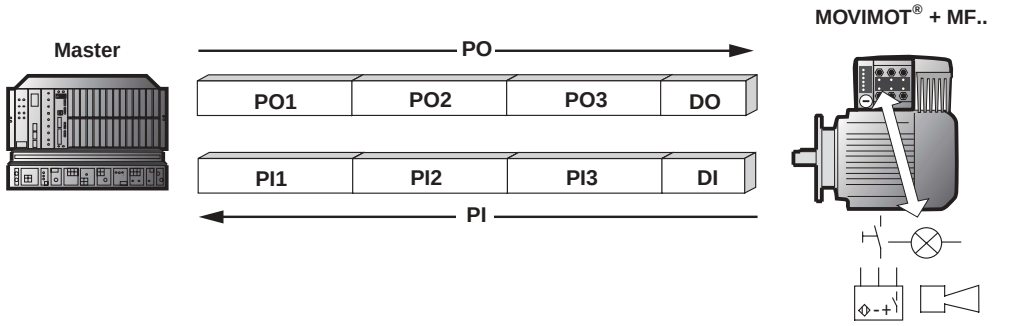
- M21_3PD.EDS

11 Function of MFO.. CANopen Interface

11.1 Process data and sensor/actuator processing

The MFO CANopen interface not only makes it possible to control MOVIMOT® AC motors but also permits connection of sensors/actuators to digital input terminals and digital output terminals. For this purpose, an additional I/O byte is added to the CANopen protocol following the process data for MOVIMOT®. The extra digital inputs and outputs of the MFO are reproduced in this I/O byte.

The process data are coded based on the uniform MOVILINK® profile for SEW drive inverters (see the chapter MOVILINK® Unit Profile).

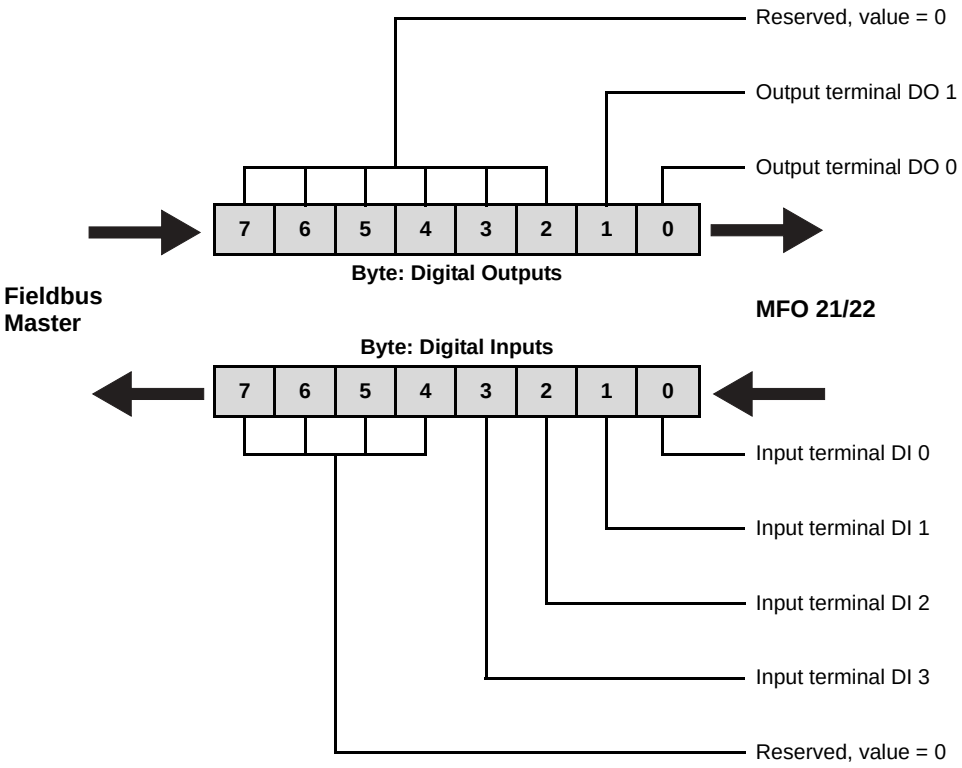


PO	Process output data	PI	Process input data
PO1	Control word (16 bit)	PI1	Status word 1 (16 bit)
PO2	Speed (16 bit) [%]	PI2	Output current (16 Bit)
PO3	Ramp (16 bit)	PI3	Status word 2 (16 bit)
DO	Digital outputs (8 bit)	DI	Digital inputs (8 bit)

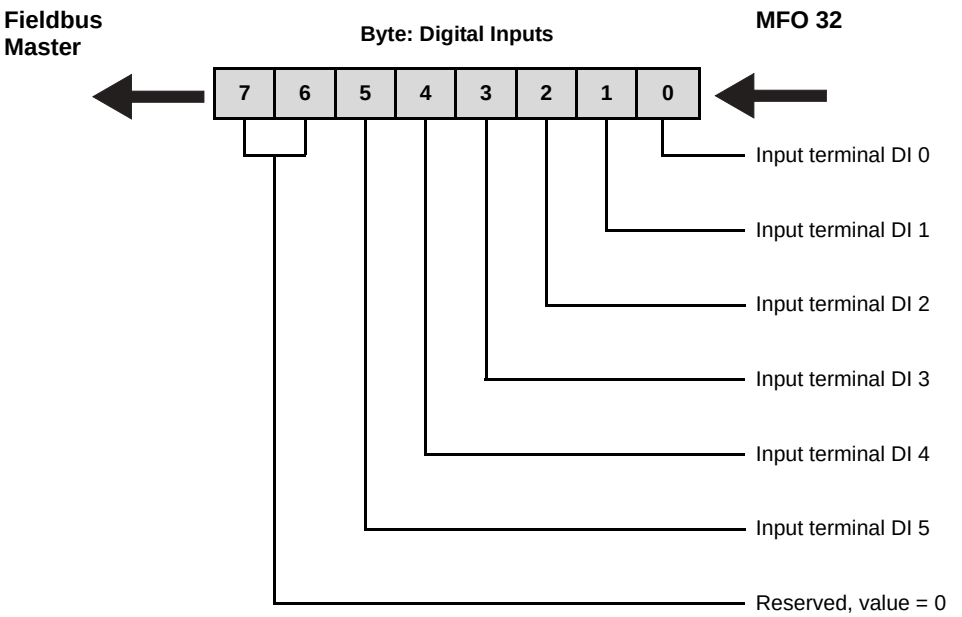
In general, all 16-bit words are transferred on the CANopen bus in the Lo/Hi sequence (first the lower-value 8 bit, then the higher-value 8 bit).

11.2 Structure of the input/output byte

MFO21/22



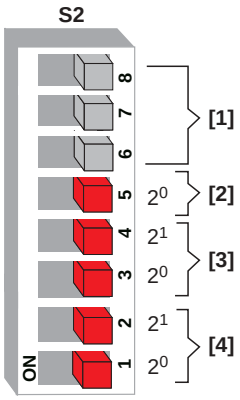
MFO32



11.3 Functions of the DIP switches

Baud rate and PD configuration

Baud rate and PD configuration of the module can be set via DIP switch block S2.



[1] Reserved
[2] I/O enable
[3] Process data width
[4] CAN bus baud rate

06127AXX

This results in the following PD configurations for the different MFO types:

DIP switch setting	Supported MFO types	Description	Data length [byte]	
			Process output data	Process input data
2PD	All MFO types	MOVIMOT® control via 2 process data words	4	4
3PD	All MFO types	MOVIMOT® control via 3 process data words	6	6
0PD+DI/DO	MFO 21/22	No MOVIMOT® control, only processing of digital inputs and outputs	1	1
2PD + DI/DO	MFO 21/22	MOVIMOT® control using 2 process data words and processing of digital inputs and outputs	5	5
3PD + DI/DO	**MFO 21/22**	**MOVIMOT® control using 3 process data words and processing of digital inputs and outputs**	**7**	**7**
0PD+DI	MFO 32	No MOVIMOT® control, only processing of digital inputs	0	1
2PD + DI	MFO 32	MOVIMOT® control using 2 process data words and processing of digital inputs	4	5
3PD + DI	MFO 32	MOVIMOT® control using 3 process data words and processing of digital inputs	6	7

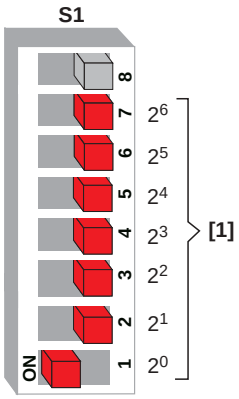
Setting the baud rates

The baud rate for the interface can be set according to the following table:

Baud rate	Value	DIP 1	DIP 2
125 kbaud	0	OFF	OFF
250 kbaud	1	ON	OFF
500 kbaud	**2**	**OFF**	**ON**
1 Mbaud	3	ON	ON

Address

With the MFO, the address is set via DIP switch S1.



[1] Valid address: 1-127

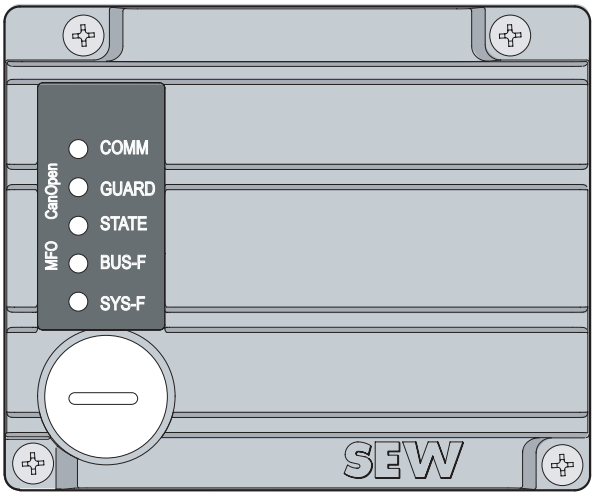
06128AXX

Important: Module address 0 is not a valid CANopen address! If Address 0 is set, the interface cannot be operated. The LEDs COMM, GUARD and STATE flash simultaneously to indicate this fault (see also the chapter "Meaning of the LED Display").

11.4 Meaning of the LED display

The MFO CANopen interface comprises five LEDs for diagnostic purposes:

- LED COMM (green) indicates data transfers from and to the node
- LED GUARD (green) indicates lifetime monitoring
- LED STATE (green) indicates the status of the bit-strobe process data channel
- LED BUS-F (red) indicates the bus status
- LED SYS-F (red) indicates MFO or MOVIMOT® system faults



50355AXX

COMM (green) The COMM LED always flashes briefly if the CANopen interface has sent a message or if a message addressed to the interface is received.

GUARD (green) The GUARD LED indicates the status of the CANopen lifetime monitoring.

LED	Message	Fault rectification
Off	• CANopen timeout monitoring for fieldbus interface is not activate (object 0x100C = 0 and/or object 0x100D=0). • This is the default setting after switch-on.	–
to	• CANopen timeout monitoring for fieldbus interface is not activate (object 0x100C≠0 and/or object 0x100D≠0).	–
Flashes green (1 s cycle)	• CANopen master did not receive any additional lifetime requests. • The fieldbus interface is in fieldbus timeout state.	• Check status of master. • Check timeout interval set in master. • Check connection between master and MFO. • Check termination of master.

STATE (green)

The STATE LED shows the current NMT status of the fieldbus interface. The fieldbus interface supports minimal BOOTUP, i.e. the statuses "pre-operational," "operational" and "stopped" exist.

LED	State	Message
Flashes (1 s cycle)	Pre-operational	• The device can only (with SDOs) be parameterized, process data (PDOs) are ignored. • This status exists after switch-on.
On	Operational	• PDOs, SDOs and NMT services are processed.
Off	Stopped	• The device ignores all SDOs and PDOs. • Only messages of the NMT are processed.

BUS-F (red)

The BUS-F LED displays the physical status of the bus node. The functions are described in the following table.

LED	Status	Message	Fault rectification
Off	Error-Active state	• The number of bus errors is in the normal range.	–
Flashes Red (1 s cycle)	Error-Passive state	• The number of physical bus faults is too high. • No more error messages are actively written to the bus.	• If this fault occurs during operation (i.e. with operational communication), the cabling and terminating resistors must be checked
Red	BusOff state	• The number of physical bus faults has continued to grow despite the switch to the error passive state. • Access to the bus is not active.	• Check the cabling, terminating resistors, baud rate and address.

SYS-F (red)

In general, the SYS-F LED is without functions in the PD configurations 0PD + DI/DO and 0PD + DI.

LED	Message	Fault rectification
Off	• Normal operating status of the MFO and MOVIMOT®	–
Flashes 1x	• MFO operating status OK, MOVIMOT® signals fault	• Evaluate the fault number in MOVIMOT® status word 1 in the controller. • Reset MOVIMOT® using the controller (reset bit in control word 1). • Read the MOVIMOT® operating instructions for additional information about fault correction.
Flashes 2x	• MOVIMOT® does not react to setpoints from the CANopen master because PD data have not been enabled.	• Check DIP switches S1/1 S1/4 on MOVIMOT®. • Set RS-485 address 1 so that the PO data are enabled.
On	• Communications link between MFO and MOVIMOT® is disrupted or interrupted.	• Check the electrical connection between MFO and MOVIMOT® (terminals RS+ and RS-) • See the chapters "Electrical Installation" and "Installation Planning under EMC Aspects."
	• Maintenance switch on field distributor is set to OFF.	• Check the setting of the maintenance switch on the field distributor.

11.5 Fault states

MFO system fault, MOVIMOT® fault

The communications link between MFO and MOVIMOT® is interrupted if the MFO signals a system fault ("SYS-F" LED continuously lit). This system fault is signaled to the controller as fault code 91 $_{dec}$ via the diagnostics channel and via the status words of the process input data. **Since this system fault generally calls attention to cabling problems or a missing 24 V supply of the MOVIMOT® inverter, a RESET via control word is not possible! As soon as the communications link is reestablished, the fault automatically resets itself.** Check the electrical connection of MFO and MOVIMOT®. In the event of a system fault, the process input data return a fixed bit pattern because valid MOVIMOT® status information is no longer available. Consequently, it only remains possible to use the status word bit 5 (malfunction) and the fault code for evaluation within the controller. No other information is valid!

Process input word	Hex value	Message
PI1: Status word 1	$5B20_{hex}$	Fault code 91 (5B hex), bit 5 (malfunction) = 1 No other status information is valid
PI2: Current actual value	0000_{hex}	Information is invalid
PI3: Status word 2	0020_{hex}	Bit 5 (malfunction) = 1 No other status information is valid
Input byte of the digital inputs	XX_{hex}	The input information of the digital inputs continues to be updated

The input information of the digital inputs is still updated and can still be evaluated within the controller.

CANopen timeout

Monitoring individual MFO.. interfaces through the master (node guarding):

To monitor the communication, the master cyclically sends a node-guarding object with set RTR bit to the interfaces. Upon readiness, the interfaces respond with a corresponding node guarding object which returns the current operating state and a toggle bit. The toggle bit changes with each message between 0 and 1.

The network master uses the response to verify whether the stations are still functional. In case of a fault, the master can initiate an action that is appropriate for the application (e.g. stopping all drives).

Node guarding is active in all operating states following the first reception of a "Node Event" from the master. Activation of node guarding is signaled through continuous illumination of the GUARD LED.

Response of MFO interfaces upon failure of the NMT master (life guarding):

Monitoring is active if *life time factor* ≠ *0* and/or *guard time* ≠ *0*.

If monitoring is activate, the MFO interface blocks the MOVIMOT® drive if the master does not trigger a "Node Event" within the timeout interval. In addition, the interface sends an EMERGENCY object via CAN bus.

The timeout interval (milliseconds) is calculated as follows:

life time factor (indices 0x100C) × *guard time (indices 0x100D)*

Timeout intervals of less than 5 ms are not accepted, the previous value remains active.

Important: The diagnostic interface and MOVITOOLS® can be used in menu item P819 to read the timeout interval set by the controller. This interval can only be changed by the controller via CANopen objects 0x100C and 0x100D and not via MOVITOOLS®.

Fieldbus timeout

Switching off the fieldbus master or an open circuit of the fieldbus cabling leads to a fieldbus timeout at the MFO. The connected MOVIMOT® units are stopped by sending "0" in each process output data word. In addition, the digital outputs are set to "0."

This process to a rapid stop on control word 1. **Caution: If MOVIMOT® is controlled with 3 process data words, the ramp is specified with 0 s in the third word!**

The "Fieldbus timeout" fault resets itself automatically, i.e. after restart of the fieldbus communication the MOVIMOT® units immediately receive the current process output data again from the controller once again.

This fault response can be deactivated via P831 of the MOVITOOLS shell.

Emergency object

The emergency object can be triggered by two events.

1. A fault occurred in MOVIMOT®, i.e. the fault bit is set in the control word. In this case, an emergency object with error code "Device specific" (0xFFFF) is transmitted.
2. The interface detected a violation of life guarding. As a result, an "emergency object" with error code "Life guard Error" (0x8130) is sent.
3. Only the 24 V supply voltage is present at the MOVIMOT®. An emergency object with error code "Mains Voltage" (0x3100) is sent.

If the fault is corrected, it is signaled by an emergency object with error code "No Error" (0x0000).

The status word is sent along with every emergency object. The exact structure is shown in the following table:

	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Contents	Emergency error code		Error register (Object 0x1001)	0	Status word from MOVIMOT®		0	0

11.6 Process data exchange

The CANopen interface always sends out process input data (TX-PDO1) if it received process output data (RX-PDO1).

In addition, the process input data can be queried with RTR-TX-PDO1.

11.7 MFO object directory

The following object directory lists the index, subindex, data type and access type of the objects supported by the CANopen MFO.. interface.

Index	Subindex	Function	Data type	Access	Default
0x1000	0	device type	UNSIGNED32	ro	0
0x1001	0	error register	UNSIGNED8	ro	-
0x1002	0	state register	UNSIGNED32	ro	-
0x1004	0	number of PDOs supported	UNSIGNED32	ro	65537
	1	number of syn. PDOs supported	UNSIGNED32	ro	0
	2	number of asy. PDOs supported	UNSIGNED32	ro	65537
0x1008	0	manufacturer device name	VISIBLE STRING	ro	-
0x1009	0	manufacturer hardware version	VISIBLE STRING	ro	-
0x100A	0	manufacturer software version	VISIBLE STRING	ro	-
0x100B	0	node ID	UNSIGNED32	ro	-
0x100C	0	guard time	UNSIGNED16	rw	0
0x100D	0	life time factor	UNSIGNED8	rw	0
0x100E	0	COB-ID node guarding	UNSIGNED32	ro	-
0x100F	0	number of SDOs supported	UNSIGNED32	ro	1
0x1014	0	COB-ID emergency object	UNSIGNED32	ro	-
0x1200	0	server SDO parameter	UNSIGNED8	ro	2
	1	COB-ID Client → Server (rx)	UNSIGNED32	ro	-
	2	COB-ID Server → Client (tx)	UNSIGNED32	ro	-
0x1400	0	RX PDO 1 communication parameter	UNSIGNED8	ro	2
	1	COB-ID used by PDO	UNSIGNED32	ro	-
	2	transmission type	UNSIGNED8	ro	254
0x1600	0	Count mapped objects	UNSIGNED8	ro	-
	1	RxPDO1 1st mapped object	UNSIGNED32	ro	-
	2 [1]	RxPDO1 2nd mapped object	UNSIGNED32	ro	-
	3 [1]	RxPDO1 3rd mapped object	UNSIGNED32	ro	-
	4 [1]	TxPDO1 4th mapped object	UNSIGNED32	ro	-
0x1800	0	TX PDO 1 communication parameter	UNSIGNED8	ro	2
	1	COB-ID used by PDO	UNSIGNED32	ro	-
	2	transmission type	UNSIGNED8	ro	254
0x1A00	0	count mapped objects	UNSIGNED8	ro	-
	1	TxPDO1 1st mapped object	UNSIGNED32	ro	-
	2 [1]	TxPDO1 2nd mapped object	UNSIGNED32	ro	-
	3 [1]	TxPDO1 3rd mapped object	UNSIGNED32	ro	-
	4 [1]	TxPDO1 4th mapped object	UNSIGNED32	ro	-

1 These entries depend upon the configuration of the number of process data words.

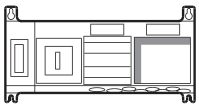
12 Supplemental Field Distributor Startup Information

Depending upon the fieldbus interface used, the startup is carried out according to the chapter:

- "Startup with DeviceNet (MFD + MQD)"
- "Startup with CANopen"

In addition, please observe the following notes on the startup of field distributors.

12.1 Field distributor MF.../Z.6., MQ.../Z.6.



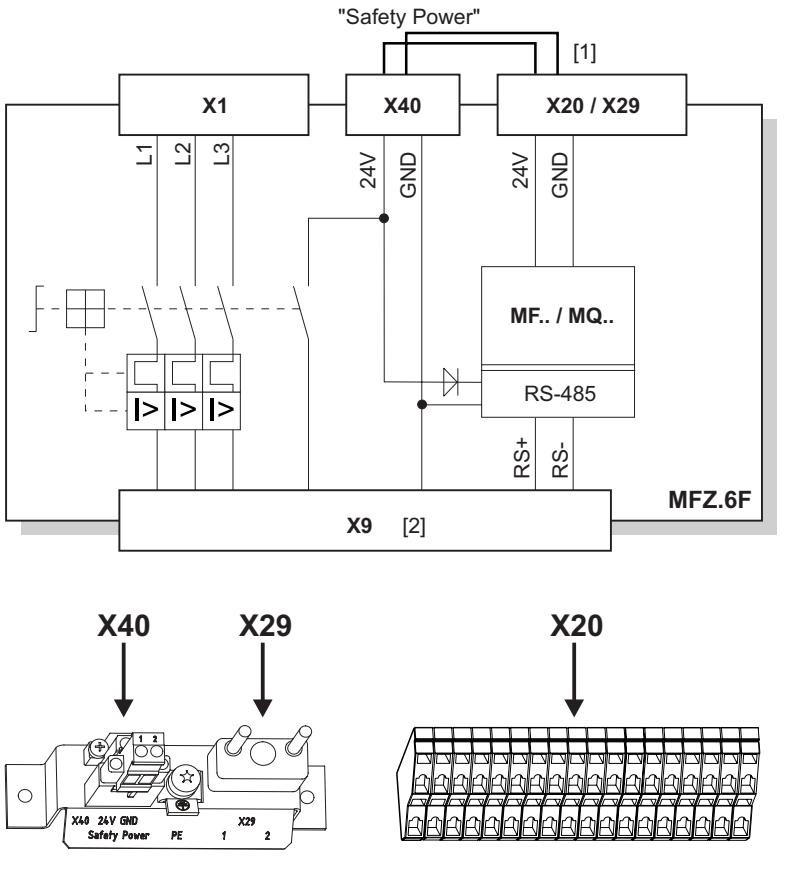
Maintenance switch

The maintenance/line protection switch of the Z.6. field distributor protects the hybrid line against overload and switches the

– Power supply of the MOVIMOT®
– 24 V_{DC} supply of the MOVIMOT®

Important: The maintenance/line protection switch disconnects only the MOVIMOT® motor from the power supply system, not the field distributor.

Block diagram:



05976AXX

[1] Jumper to supply of MOVIMOT® from 24 V_{DC} voltage for MF../MQ.. fieldbus module (wired at factory)
[2] Connection of hybrid cable

12.2 Field distributors MF.../MM../Z.7., MQ.../MM../Z.7.

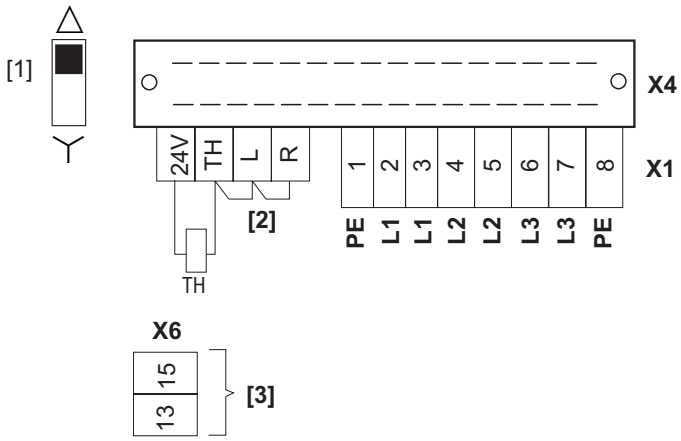
Checking the method of connection for the connected motor

Use the following figure to verify that the selected connection method is identical for the field distributor and the connected motor.

03636AXX

Important: For brake motors: Do not install brake rectifiers inside the terminal box of the motor!

Internal wiring of the MOVIMOT® inverter in the field distributor

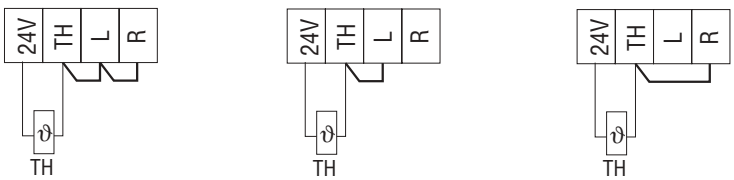


05986AXX

[1] DIP switch for setting the method of connection
Make sure that the connection method of the connected motor matches the setting of the DIP switch.

[2] **Note the released direction of rotation**
(default enables both directions of rotation)

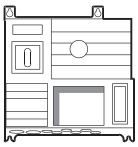
Both directions of rotation are enabled	Only direction of rotation **CCW** is enabled	Only direction of rotation **CW** is enabled



04957AXX

[3] Standard integrated braking resistor (only in motors without brake)

12.3 MF.../MM../Z.8., MQ.../MM../Z.8. field distributors



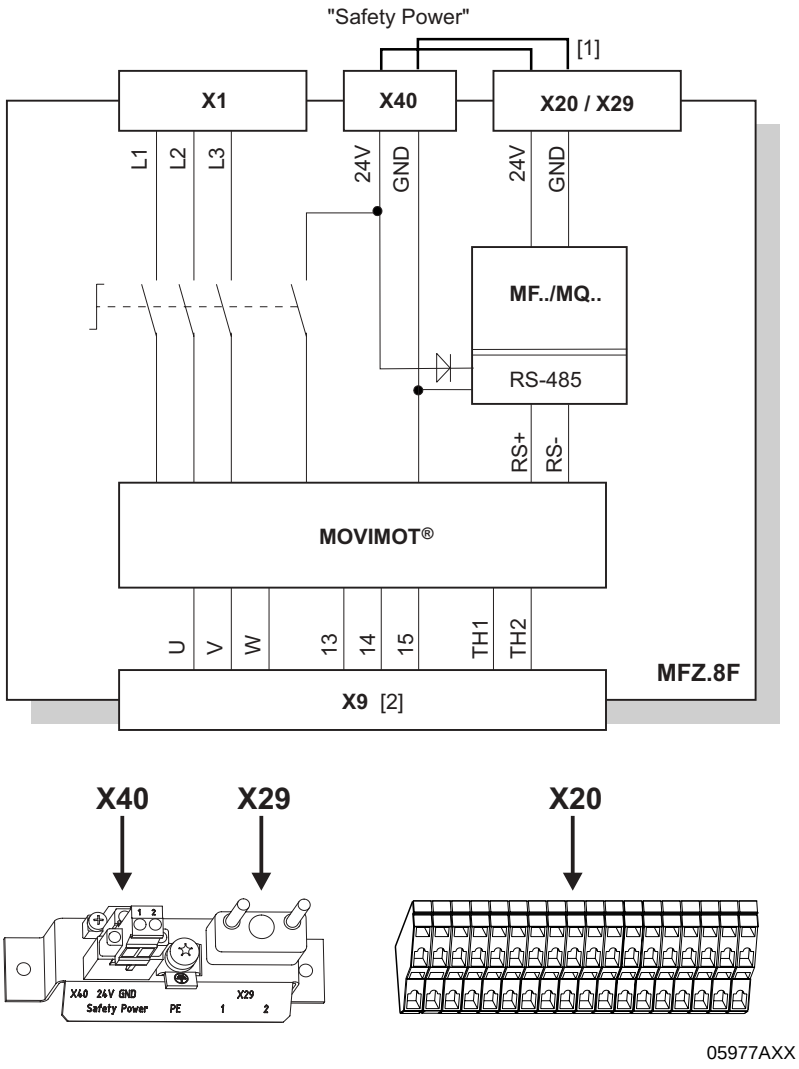
Maintenance switch

The maintenance switch of the Z.8. field distributor switches the

– Power supply of the MOVIMOT®
– 24 V_{DC} supply of the MOVIMOT®

Important: The maintenance switch disconnects the MOVIMOT® inverter with connected motor from the power supply system, but not the field distributor.

Block diagram:



05977AXX

[1] Jumper to supply of MOVIMOT® from 24 V_{DC} voltage for MF.. fieldbus module (wired at factory)
[2] Connection of hybrid cable

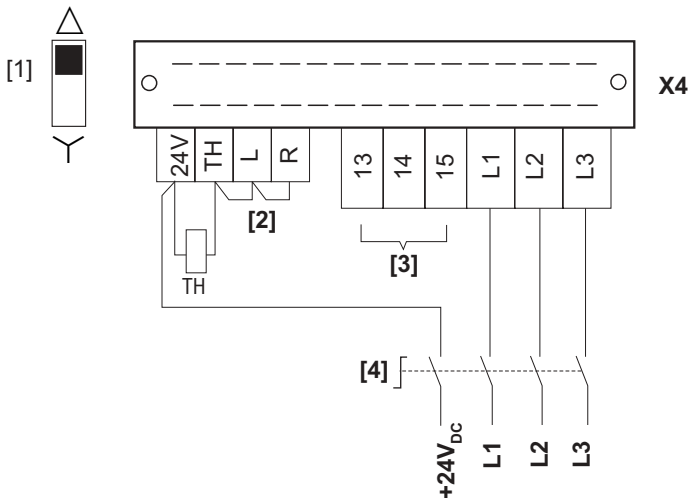
Checking the method of connection for the connected motor

Use the following figure to verify that the selected connection method is identical for the field distributor and the connected motor.

03636AXX

Important: For brake motors: Do not install brake rectifiers inside the terminal box of the motor!

Internal wiring of the MOVIMOT® inverter in the field distributor

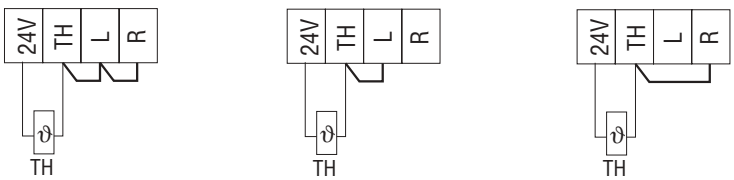


05981AXX

[1] DIP switch for setting the method of connection
Make sure that the connection method of the connected motor matches the setting of the DIP switch.

[2] **Note the released direction of rotation**
(default enables both directions of rotation)

Both directions of rotation are enabled	Only direction of rotation **CCW** is enabled	Only direction of rotation **CW** is enabled



04957AXX

[3] Connection for internal braking resistor (in motors without brake only)

[4] Maintenance switch

12.4 MOVIMOT® frequency inverter integrated in field distributor

The following section describes the changes that are necessary to operate the MOVIMOT® frequency inverter integrated in the field distributor compared to the use of the inverter when it is integrated in the motor.

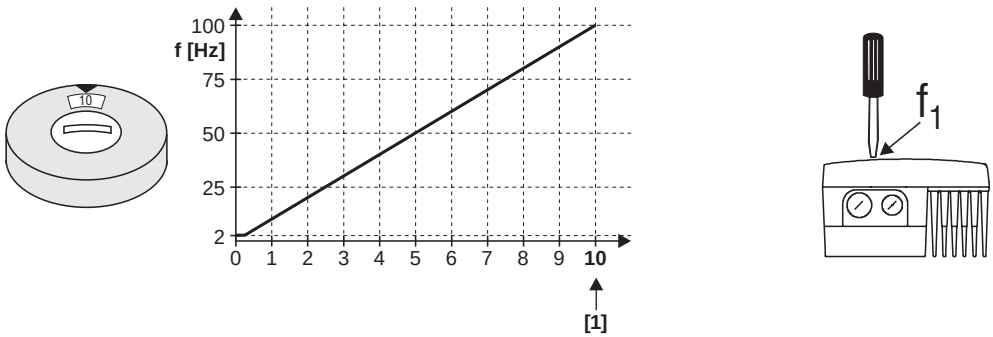
Changed factory setting for MOVIMOT® units integrated in the field distributor

Note the **changes to the factory settings when using MOVIMOT® integrated in Z.7 or Z.8. field distributors.** The remaining settings are identical to those for operation of MOVIMOT® units integrated in the motor. Consult the "MOVIMOT® MM03C–MM3XC Operating Instructions."

DIP switch S1:

S1	1	2	3	4	5	6	7	8
Message	**RS-485 address**				**Motor protection**	**Motor rating class**	**PWM frequency**	**No-load damping**
	2^0	2^1	2^2	2^3				
ON	**1**	1	1	1	**Off**	Motor one size smaller	**Variable** (16, 8, 4 kHz)	On
OFF	0	**0**	**0**	**0**	On	**adapted**	4 kHz	**Off**

f1 setpoint potentiometer:



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[1] Factory setting

Special functions for MOVIMOT® integrated in the field distributor

The following special functions are possible (to a limited extent) with the use of MOVIMOT® integrated in the Z.7/Z.8 field distributor. A detailed description of the special functions can be found in the "MOVIMOT® MM03C–MM3XC" operating instructions.

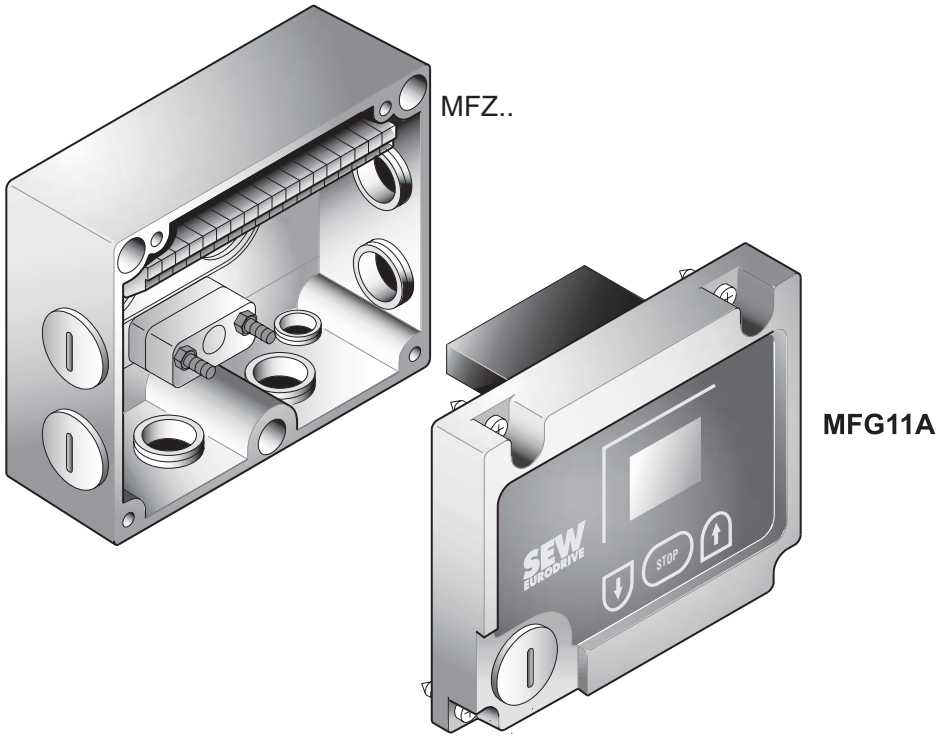
Special function		Restriction
1	MOVIMOT® with increased ramp times	–
2	MOVIMOT® with adjustable current limitation (fault if exceeded)	–
3	MOVIMOT® with adjustable current limitation (switchable via terminal f1/f2)	–
4	MOVIMOT® with bus parameter setting	only with MQ.. fieldbus interfaces
5	MOVIMOT® with motor protection in Z.7/Z.8 field distributor	–
6	MOVIMOT® with maximum 8 kHz PWM frequency	–
7	MOVIMOT® with rapid start/stop	**The mechanical brake must only be controlled by MOVIMOT®. Controlling the brake via relay output is not possible**.
8	MOVIMOT® with minimum frequency 0 Hz	–
10	MOVIMOT® with minimum frequency 0 Hz and reduced torque at low frequencies	–
11	Monitoring of supply phase fault is deactivated	–
12	MOVIMOT® with quick start/stop and motor protection in Z.7 and Z.8 field distributors	–

Special function 9 "MOVIMOT® for hoisting applications" must not be used for MOVIMOT® inverters integrated in Z.7/Z.8 field distributors!

13 MFG11A Keypad

13.1 Function

The MFG11A keypad is plugged onto any MFZ.. connection module instead of a fieldbus interface for manual control of a MOVIMOT® drive.



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13.2 Operation

Operation of the MFG11A option	
Display	Negative display value e.g.:  = Counterclockwise rotation Positive display value e.g.:  = Clockwise rotation The displayed value indicates the speed set with the setpoint potentiometer f1. Example: Display "50" = 50 % of the speed set with the setpoint potentiometer. Important: If the display is "0," the drive is rotating at f_{min}.
Increasing the speed	With CW rotation:  With CCW rotation: 
Reducing the speed	With CW rotation:  With CCW rotation: 
Blocking MOVIMOT®	Pressing the key:  Display = 
Enable MOVIMOT®	 **or**  Important: After enable, MOVIMOT® accelerates to the value and direction of rotation saved last.
Changing direction of rotation from CW to CCW	1.  Until display =  2. Pressing it again  changes direction of rotation from CW to CCW.
Changing direction of rotation from CCW to CW	1.  Until display =  2. Pressing it again  changes direction of rotation from CCW to CW.

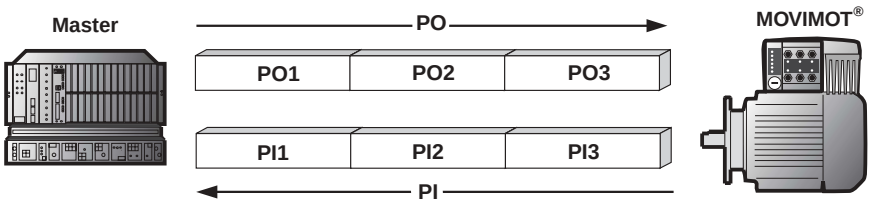
After power-on, the module is always in STOP status (display = OFF). If direction of rotation is selected with arrow key, the drive (setpoint) starts with 0.

14 MOVILINK® Unit Profile

14.1 Coding of process data

The same process data information is used for controlling and selecting setpoints for all fieldbus systems. The process data are coded using the uniform MOVILINK® profile for SEW drive inverters. In the case of MOVIMOT®, it is always possible to differentiate between the following variants:

- Two process data words (2 PD)
- Three process data words (3 PD)



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PO = Process output data	PI = Process input data
PO1 = Control word	PI1 = Status word 1
PO2 = Speed (%)	PI2 = Output current
PO3 = Ramp	PI3 = Status word 2

Two process data words

The master controller sends the process output data 'Control word' and 'Speed [%]' to the MOVIMOT® unit to control MOVIMOT® using two process data words; the process input data 'Status word 1' and 'Output current' are sent from the MOVIMOT® unit to the programmable controller.

Three process data words

When control takes place with three process data words, 'Ramp' is sent as additional process output data word; 'Status word 2' is sent as third process input data word.

Process output data

Process output data are sent from the master controller to the MOVIMOT® inverter (control information and setpoints). However, they only come into effect in MOVIMOT® if the RS-485 address in MOVIMOT® (DIP switches S1/1 to S1/4) is set to a value other than 0. MOVIMOT® can be controlled with the following process output data:

- PO1: Control word
- PO2: Speed [%] (setpoint)
- PO3: Ramp

	Basic control block															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
PO1: Control word	Reserved for special functions = "0"									"1" = Reset	reserved = "0"			"1 1 0" = Release otherwise stop		
PO2: Setpoint	Signed percentage / 0.0061 % **Example:** -80% / 0.0061 % = - 13115 = $CCC5_{hex}$															
PO3: Ramp (three word protocol only)	Time from 0 to 50 Hz in ms (range: 100...10000 ms) **Example:** 0.2 s = 2000 ms = $07DO_{hex}$															

Control word, bits 0...2

The "Enable" control command is specified with bits 0...2 by entering the control word = 0006_{hex}. The CW and/or CCW input terminal must also be set to +24 V (jumpered) to enable the MOVIMOT® unit.

The "Stop" control command is issued by resetting bit 2 = "0." You should use the stop command 0002_{hex} to ensure compatibility with other SEW inverter products. MOVIMOT® always triggers a stop at the current ramp whenever bit 2 = "0," regardless of the status of bit 0 and bit 1.

Control word bit 6 = Reset

In the event of a malfunction, the fault can be acknowledged with bit 6 = "1" (Reset). The value of unassigned control bits should be 0 to ensure compatibility.

Speed [%]

The speed setpoint is specified as a percentage value in reference to the maximum speed set with the f1 setpoint potentiometer.

Coding: $C000_{hex}$ = -100 % (counterclockwise rotation)
4000_{hex} = +100 % (clockwise rotation)
$\rightarrow$ 1 digit = 0,0061 %

Example: 80 % f_{max}, CCW rotation :

Calculation: –80 % / 0.0061 = $–13115_{dec}$ = $CCC5_{hex}$

Ramp

If the process data exchange takes place using three process data words, the current integrator ramp is transmitted in process output data word PO3 . The integrator ramp set with switch t1 is used if MOVIMOT® is controlled by two process data.

Coding: 1 digit = 1 ms

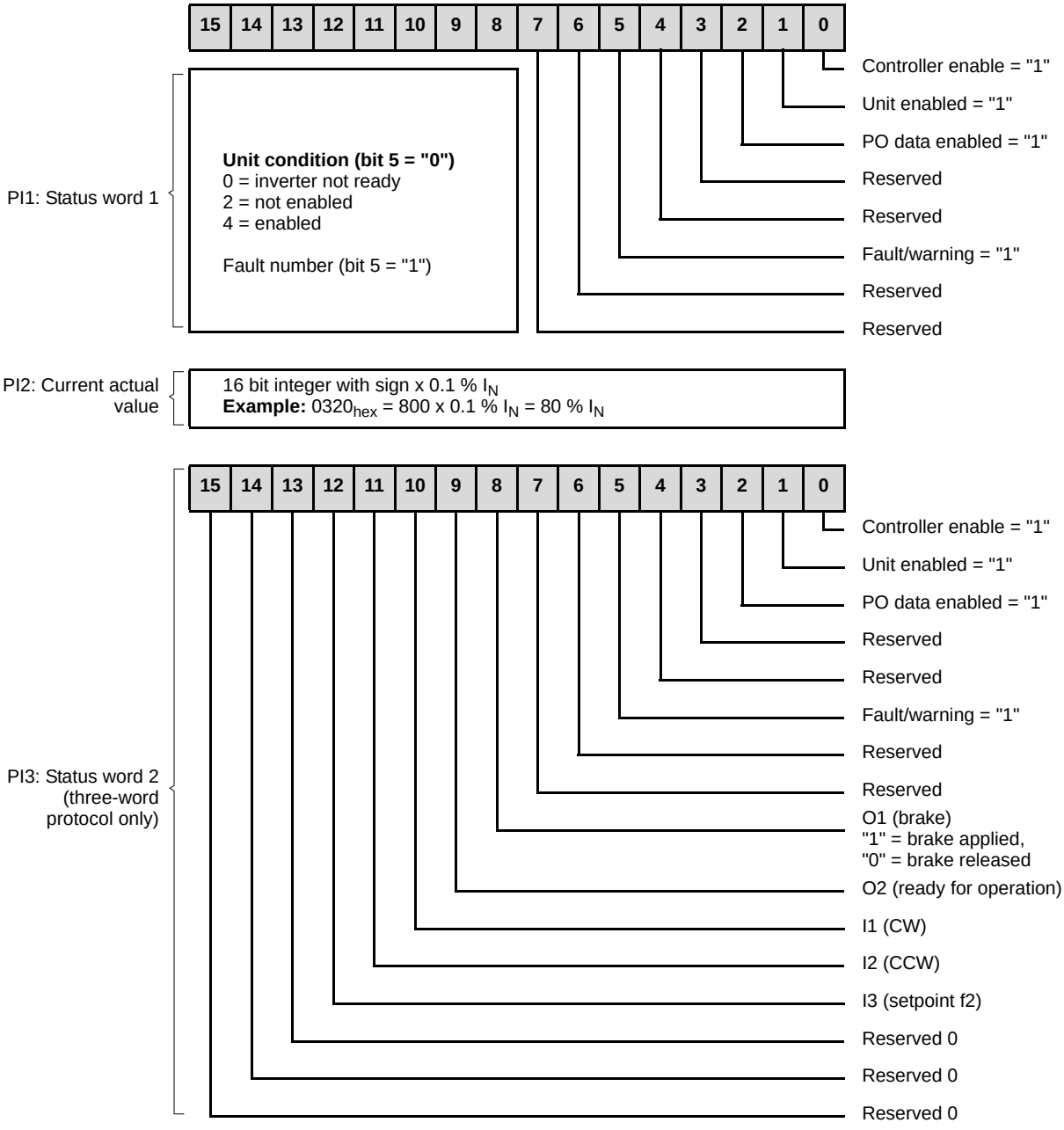
Range: 100...10000 ms

Example: 2.0 s = 2000 ms = 2000_{dec} = $07D0_{hex}$

Process input data

The MOVIMOT® inverter sends back process input data to the master controller. The process input data consist of status and actual value information. MOVIMOT® supports the following process input data:

- PI1: Status word 1
- PI2: Output current
- PI3: Status word 2



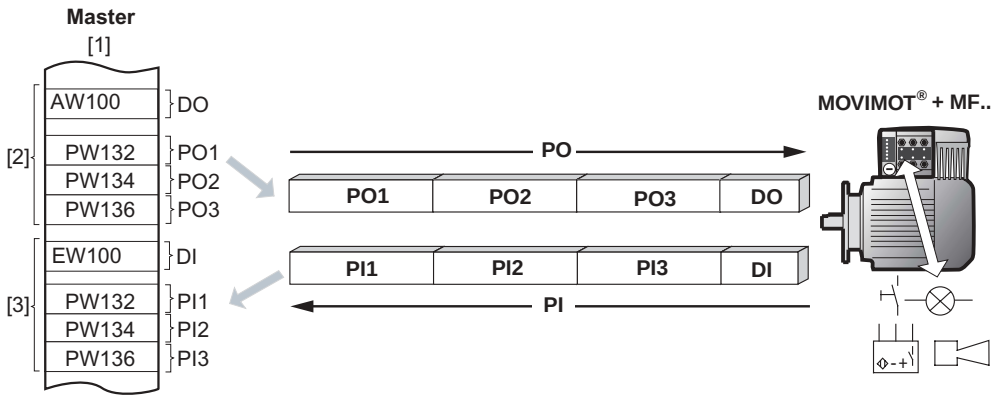
14.2 Sample program with Simatic S7 and fieldbus

A sample program for the Simatic S7 illustrates the processing of process data as well as the digital inputs and outputs of the MF fieldbus interface.

Address assignment of the process data in the automation equipment

In the example, the process data of the MOVIMOT® fieldbus interface are stored in the PLC memory area PW132 – PW136.

The additional output/input word is administered in AW 100 and EW 100.



[1]	Address range	PO	Process output data	PI	Process input data
[2]	Output addresses	PO1	Control word	PI1	Status word 1
[3]	Input addresses	PO2	Speed [%]	PI2	Output current
		PO3	Ramp	PI3	Status word 2
		DO	Digital outputs	DI	Digital inputs

Processing the digital inputs / outputs of the MF..

The AND operation of digital inputs DI 0..3 controls the digital outputs DO 0 and DO 1 on the MF... interface:

```
U E 100.0   //          If DI 0 = "1"
U E 100.1   //          DI 1 = "1"
U E 100.2   //          DI 2 = "1"
U E 100.3   //          DI 3 = "1"
= A 100.0   // then     DO 0 = "1"
= A 100.1   //          DO 1 = "1"
```

MOVIMOT® control

You enable the MOVIMOT® drive with input 4.0:

- E 100.0 = "0": Control command "Stop"
- E 100.0 = "1": Control command "Enable"

The direction of rotation and speed are specified via input 4.1:

- E 100.1 = "0": 50 % f_{max} CW rotation
- E 100.1 = "1": 50 % f_{max} CCW rotation

The drive is accelerated and decelerated with an integrator ramp of 1 s.

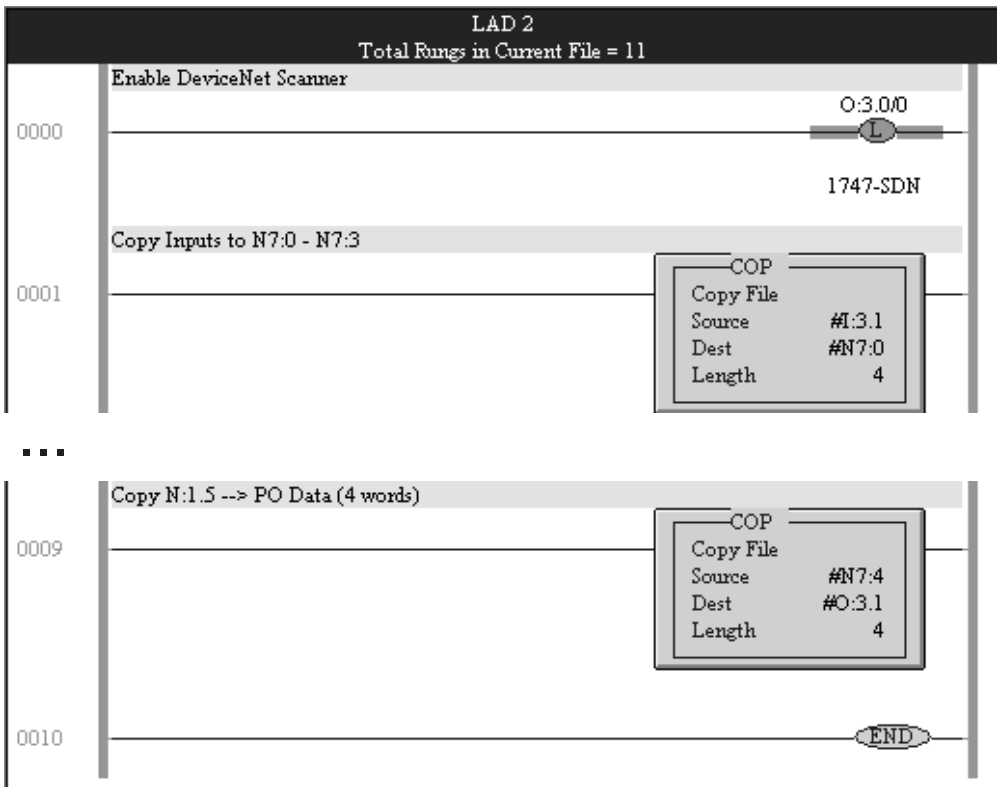
The process input data are temporarily stored in flag words 20 to 24 for further processing.

```
      U     E 100.0     // Issue "Enable" control command with input 100.0
      SPB FREI

      L     W#16#2      //Control command "Stop"
      T     PAW 132     // is written to PO1 (control word 1)
      SPA   SOLL

FREI: L     W#16#6      // MOVIMOT control command "Freigabe" (0006hex)
      T     PAW 132     // is written to PO1 (control word 1)

SOLL: U     E 100.1     // Define direction of rotation with input 100.1
      SPB   LINK        // If input 100.1 = "1", then CCW
      L     W#16#2000   // Set speed = 50% fmax CW rotation (=2000hex)
      T     PAW 134     // is written to PO2 (Speed [%])
      SPA   ISTW

LINK: L     W#16#E000   // Set speed = 50% fmax CCW rotation (=E000hex)
      T     PAW 134     // is written to PO2 (Speed [%])

ISTW: L     1000        // Ramp = 1 s (1000dec)
      T     PAW 136     // is written to PO3 (Ramp)

      L     PEW 132     // Load PI1 (Status word 1)
      T MW 20           // and store in buffer
      L     PEW 134     // Load PI2 (Output current)
      T MW 22           // and store in buffer
      L     PEW 136     // Load PI3 (Status word 2)
      T MW 24           // and store in buffer

      BE
```

14.3 Sample program with DeviceNet

A sample program for the SLC500 from Allen Bradley illustrates the processing of process data as well as the digital inputs and outputs of the MFD2. fieldbus interface.

In the sample, the process output data of the MOVIMOT® fieldbus interface are stored in the PLC memory area O:3.1 to O:3.3 and the process input data in the memory area I:3.1 to I:3.3. In rung 1, the output data are written to the memory area N7:0 to N7:2 and the input data to the memory area N7:4 to N7:6.



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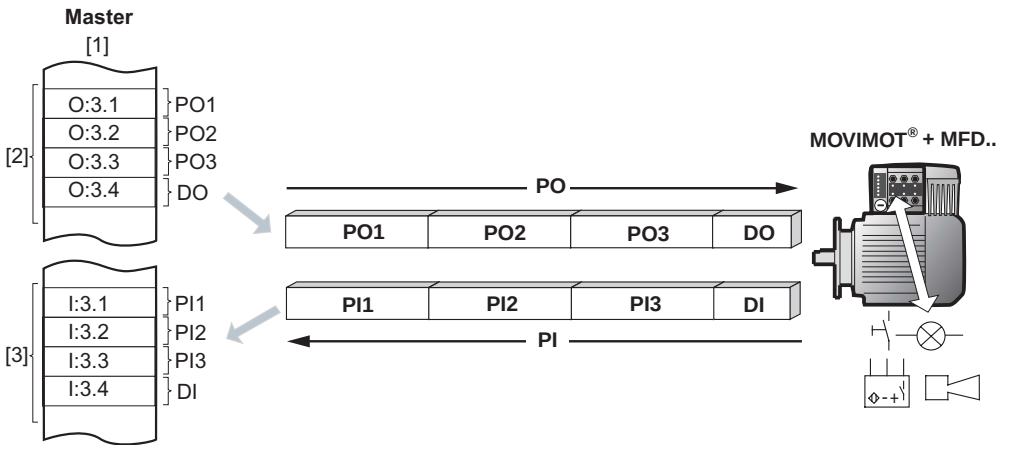
The additional output byte (O:3.3/0 - O:3.3/7) is managed in N7:3 and the input byte (I:3.3/0 - I3.3/7) in N7:7.



[1] Address range
[2] Output addresses
[3] Input addresses

PO	Process output data	PI	Process input data
PO1	Control word	PI1	Status word 1
PO2	Speed [%]	PI2	Output current
PO3	Ramp	PI3	Status word 2
DO	Digital outputs	DI	Digital inputs

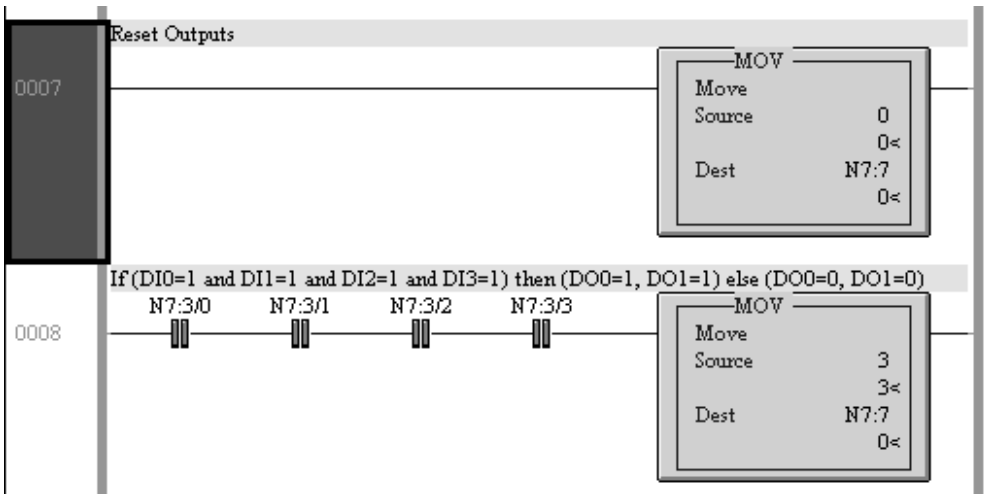
Processing of the process data in the copied memory area of the controller

Process output data	Memory area in the controller	Process data words	
O:3.1	N7:0	PO1	
O:3.2	N7:1	PO2	
O:3.3	N7:2	PO3	
O:3.4	N7:3	open	DO

Process input data	Memory area in the controller	Process data words	
I:3.1	N7:4	PI1	
I:3.2	N7:5	PI2	
I:3.3	N7:6	PI3	
I:3.4	N7:7	open	DI

Processing of digital inputs/outputs of MFD2.

The output bits are controlled using an AND logic operation of the input bits. If all input bits = 1, the output bits DO0 and DO1 are set. Otherwise, the output bits are reset (=0).



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MOVIMOT® control

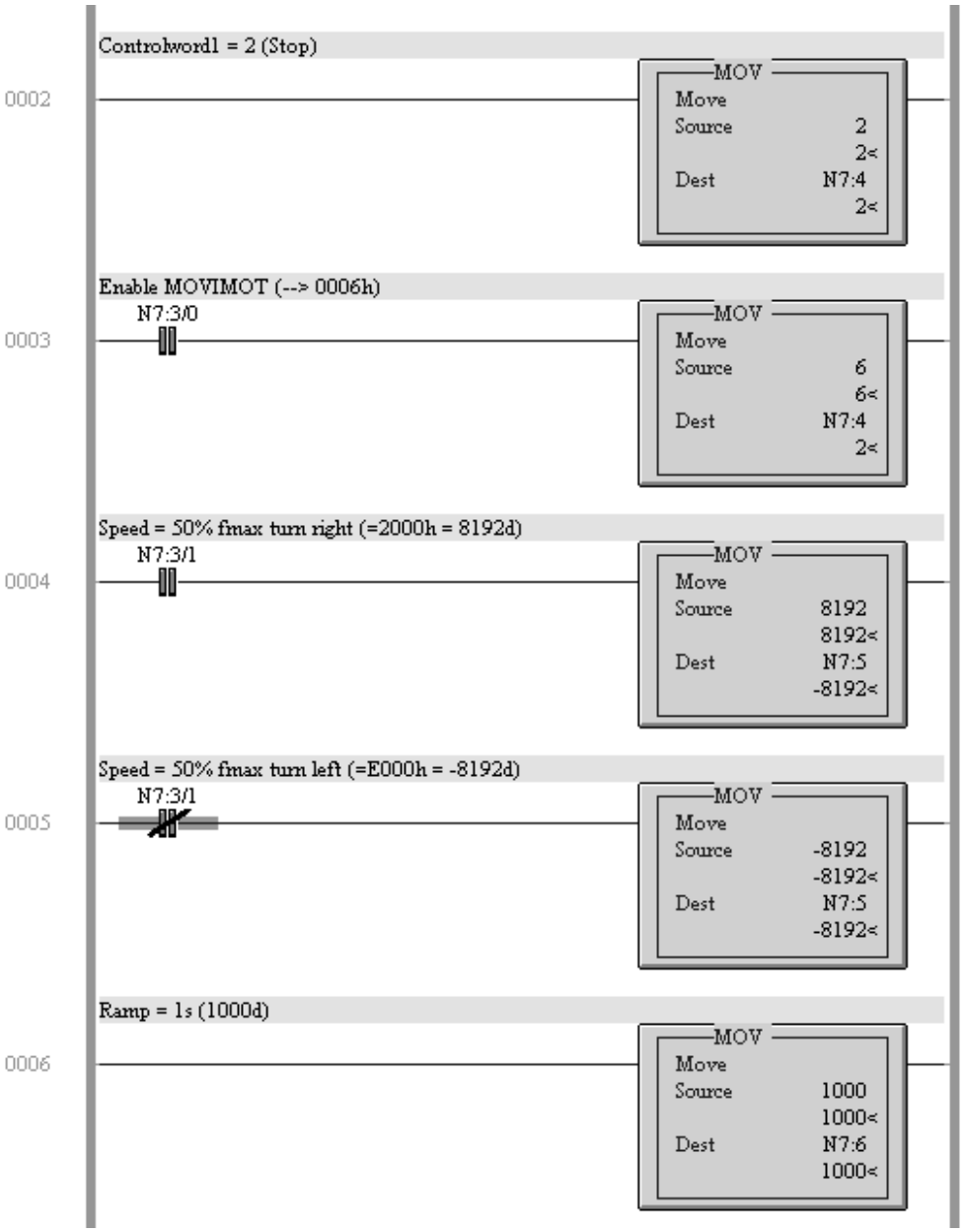
The MOVIMOT® drive is released with input bit DI0 (N7:3/0):

- N7:3/0=0 Stop control command
- N7:3/0=0 Enable control command

Input bit DI01 (N7:3/1) is used to set the direction of rotation and speed:

- N7:3/1=0: 50% f_{max} CW rotation
- N7:3/1=1: 50% f_{max} CCW rotation

The drive is accelerated or decelerated with a ramp generator of 1 s. The process input data are buffered in memory area N7:4 to N7:6 for additional processing.



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15 Parameters

15.1 MQ.. parameter list

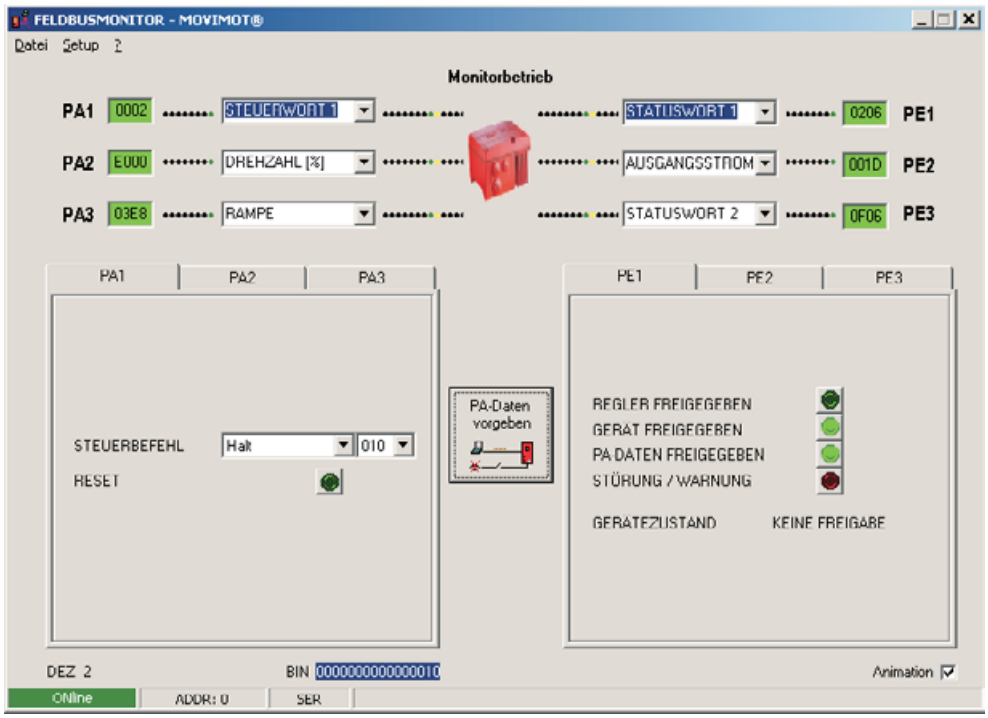
Parameter	Parameter designation	Index	Unit	Access	Default	Meaning / value range
010	Inverter status	8310		RO	0	Low word coded like status word 1
011	Operational status	8310		RO	0	Low word coded like status word 1
012	Fault status	8310		RO	0	Low word coded like status word 1
013	Active parameter set	8310		RO	0	Low word coded like status word 1
015	Switch-on time	8328	[s]	RO	0	
030	Binary input DI00	8844		RW	16	0: No function 16: IPOS input 32: MQX Encoder In
031	Binary input DI01	8335		RW	16	
032	Binary input DI02	8336		RO	16	
033	Binary input DI03	8337		RO	16	
034	Binary input DI04	8338		RO	16	
035	Binary input DI05	8339		RO	16	
036	Binary inputs DI00 – DI05	8334		RO	16	
050	Binary output DO00	8843		RW	21	0: No function 21: IPOS output 22: IPOS fault
051	Binary output DO01	8350		RW	21	
053	Binary output DO00...	8360		RO		
070	Unit type	8301		RO		
076	Firmware basic unit	8300		RO		
090	PD configuration	8451		RO		
091	Fieldbus type	8452		RO		
092	Fieldbus baud rate	8453		RO		
093	Fieldbus address	8454		RO		
094	PO1 setpoint	8455		RO		
095	PO2 setpoint	8456		RO		
096	PO3 setpoint	8457		RO		
097	PI1 actual value	8458		RO		
098	PI2 actual value	8459		RO		
099	PI3 actual value	8460		RO		
504	Encoder monitoring	8832		RW	1	0: OFF 1: ON
608	Binary input DI00	8844		RW	16	0: No function 16: IPOS input 32: MQX Encoder In
600	Binary input DI01	8335		RW	16	
601	Binary input DI02	8336		RO	16	
602	Binary input DI03	8337		RO	16	
603	Binary input DI04	8338		RO	16	
604	Binary input DI05	8339		RO	16	
628	Binary output DO00	8843		RW	21	0: No function 21: IPOS output 22: IPOS fault
620	Binary output DO01	8350		RW	21	
802	Factory setting	8594		R/RW	0	0: No 1: Yes 2: Delivery state
810	RS-485 address	8597		RO	0	
812	RS-485 timeout interval	8599	[s]	RO	1	
819	Fieldbus timeout interval	8606	[s]	RO		
831	Response fieldbus timeout	8610		RW	10	0: No response 10: PO DATA = 0

Parameter	Parameter designation	Index	Unit	Access	Default	Meaning / value range
840	Manual reset	8617		RW		0: OFF 1: ON
870	PO1 setpoint description	8304		RO	12	IPOS PO DATA
871	PO2 setpoint description	8305		RO	12	IPOS PO DATA
872	PO3 setpoint description	8306		RO	12	IPOS PO DATA
873	PI1 actual value description	8307		RO	9	IPOS PI DATA
874	PI2 actual value description	8308		RO	9	IPOS PI DATA
875	PI3 actual value description	8309		RO	9	IPOS PI DATA
-	IPOS control word	8691		RW	0	
-	IPOS program length	8695		RW	0	
-	IPOS variable H0 – H9	11000-11009		RW	–	Memory-resident variable
-	IPOS variable H10 – H511	11010-11511		RW	0	
-	IPOS code	16000-17023		RW	0	

16 Bus Diagnostics with MOVITOOLS

16.1 Fieldbus diagnostics via MF../MQ.. diagnostics interface

MF../MQ.. fieldbus modules are equipped with a diagnostics interface for startup and service. This interface allows for bus diagnostics with the SEW operating software MOVITOOLS.



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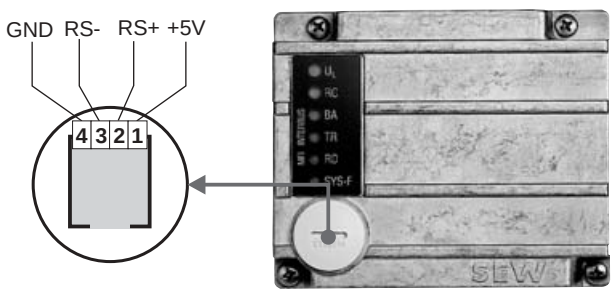
Setpoint and actual values that are exchanged between MOVIMOT® and the fieldbus master can be easily diagnosed.

The MOVIMOT® unit can be directly controlled in the "Controller" fieldbus monitor operating mode. See the section "The fieldbus monitor in MOVITOOLS" on page 131.

Structure of the diagnostics interface

The diagnostics interface is located on potential level 0; the same potential as the module electronics. This setup applies to all MF../MQ.. fieldbus interfaces. The diagnostics interface of the MFK.. AS-i interfaces is on the MOVIMOT® potential.

The interface is accessible via a 4-pole plug connector "modular jack 4/4 (RJ11)." The interface is located underneath the cable gland on the module cover.



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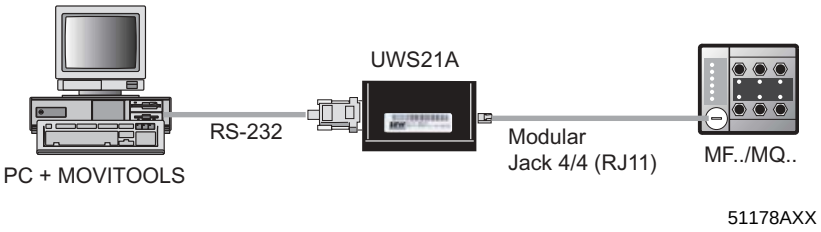
MWS21A option

The diagnostics interface can be connected to a commercially available PC with a serial interface (RS-232) using SEW's MOVIMOT® fieldbus diagnostic kit MWS21A (part number: 823 180X).



Scope of delivery of MWS21A:

- Interface adapter
- Cable with modular jack 4/4 (RJ11) plug connector
- RS-232 interface cable
- SOFTWARE-ROM 4 (MOVITOOLS software)

Relevant diagnostics parameters

The MOVITOOLS Shell software can be used for diagnostics of the MOVIMOT® unit via the diagnostics interface of the MF../MQ.. fieldbus interfaces.

Display values - 00. Process values

MOVIMOT® returns the output current as process value.

Menu number	Parameter name	Index	Meaning / Implementation
004	Output current [%In]	8321	Output current MOVIMOT®

Display values - 01. Status display

MOVIMOT® status is completely interpreted and displayed on the status display.

Menu number	Parameter name	Index	Meaning / Implementation
010	Inverter status	8310	Inverter status MOVIMOT®
011	Operational status	8310	Operating status MOVIMOT®
012	Fault status	8310	Fault status MOVIMOT®

Display values - 04. Binary input option

The digital inputs of the MF.. fieldbus interfaces are shown as optional MOVIMOT® inputs. Since these inputs do not have a direct effect on the MOVIMOT®, the terminal assignment is set to "No function."

Menu number	Parameter name	Index	Meaning / Implementation
040	Binary inputs DI10	8340	Status of MF.. binary inputs DI0
041	Binary inputs DI11	8341	Status of MF.. binary inputs DI1
042	Binary inputs DI12	8342	Status of MF.. binary inputs DI2
043	Binary inputs DI13	8343	Status of MF.. binary inputs DI3
044	Binary inputs DI14	8344	Status of MF.. binary inputs DI4
045	Binary inputs DI15	8345	Status of MF.. binary inputs DI5
046	Binary inputs DI10 to DI17	8348	Status of all binary inputs

Display values - 06. Binary output option

The digital outputs of the MF.. fieldbus interfaces are shown as optional MOVIMOT® outputs. Since these outputs do not have a direct effect on MOVIMOT®, the terminal assignment is set to "No function."

Menu number	Parameter name	Index	Meaning / Implementation
060	Binary outputs DO10	8352	Status of MF.. binary outputs DO0
061	Binary outputs DO11	8353	Status of MF.. binary outputs DO
068	Binary outputs DO10 to DO17	8360	Status of MF.. binary outputs DO0 and DO1

Display values - 07. Unit data

The unit data display information on the MOVIMOT® and MF.. fieldbus interface.

Menu number	Parameter name	Index	Meaning / Implementation
070	Unit type	8301	Unit type MOVIMOT®
072	Option 1	8362	Unit type option 1 = MF.. Type
074	Firmware option 1	8364	Firmware part number MF..
076	Firmware basic unit	8300	Firmware part number MOVIMOT®

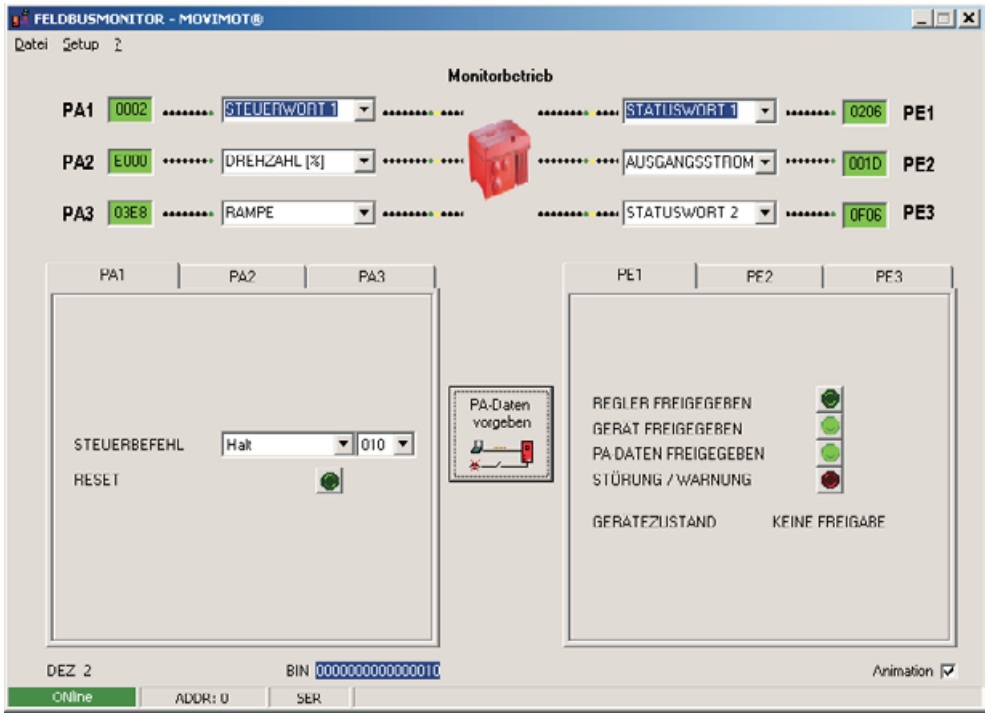
Display values - 09. Bus diagnostics

This menu item represents all fieldbus data.

Menu number	Parameter name	Index	Meaning / Implementation
090	PD configuration	8451	PD configuration set for MOVIMOT®
091	Fieldbus type	8452	Fieldbus type of MF..
092	Fieldbus baud rate	8453	Baud rate of MF..
093	Fieldbus address	8454	Fieldbus address of MF.. DIP switch
094	PO1 setpoint [hex]	8455	PO1 setpoint from fieldbus master to MOVIMOT®
095	PO2 setpoint [hex]	8456	PO2 setpoint from fieldbus master to MOVIMOT®
096	PO3 setpoint [hex]	8457	PO3 Setpoint from fieldbus master to MOVIMOT®
097	PI1 actual value [hex]	8458	PI1 actual value from MOVIMOT® to fieldbus master
098	PI2 actual value [hex]	8459	PI2 actual value from MOVIMOT® to fieldbus master
099	PI3 actual value [hex]	8460	PI3 Actual value from MOVIMOT® to fieldbus master

The fieldbus monitor in MOVITOOLS

The MOVITOOLS fieldbus monitor makes for convenient control and visualization of cyclical MOVIMOT® process data.



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Features

- Simple operation
- User-friendly familiarization with control functions even without connection to the fieldbus (preparation for startup)
- Integrated into SEW user interface MOVITOOLS
- Simple and quick troubleshooting
- Shortest project planning phase

Function of the fieldbus monitor

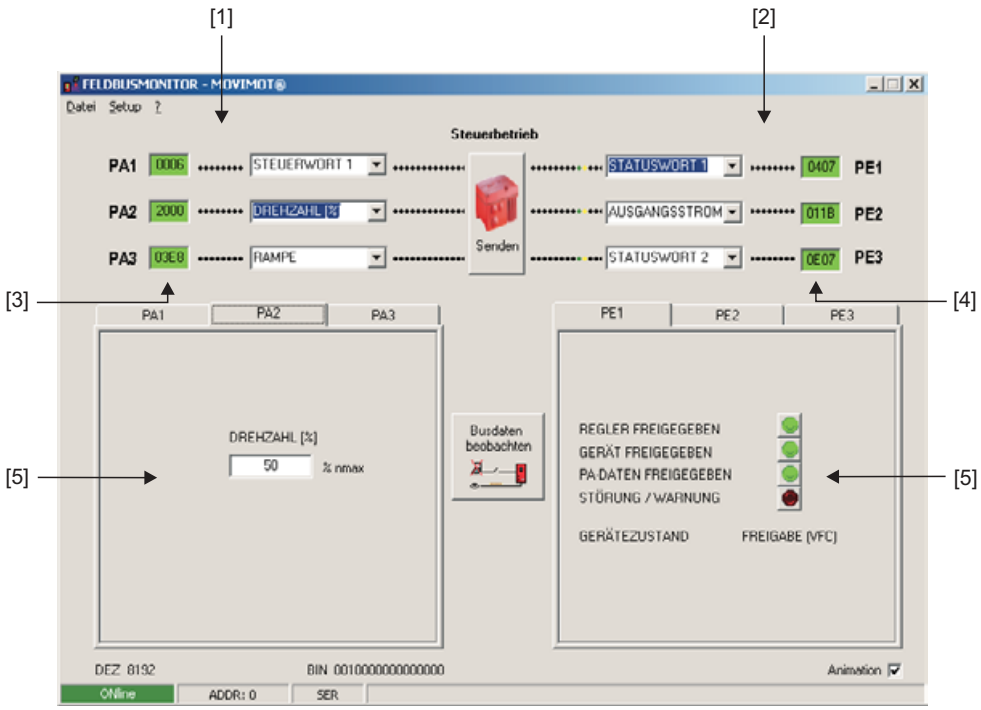
The fieldbus monitor provides the user with a powerful tool for startup and troubleshooting. It can be used to display and interpret cyclically exchanged process data between inverter and control unit.

The fieldbus monitor lets you monitor the bus operation as a passive participant or take active control of the inverter.

This option provides the user with the following possibilities:

- To interactively take over control of the inverter in an existing system and check the functionality of the drive.
- To remotely simulate the operating principle of an individual drive (without existing system and fieldbus master) so that the control functions can be tested prior to startup.

Fieldbus monitor in controller operating mode



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[1] PO data from controller
[2] PI data from inverter to controller
[3] Current HEX values of process output data (can be edited)
[4] Current HEX values of process input data
[5] Displays current setting

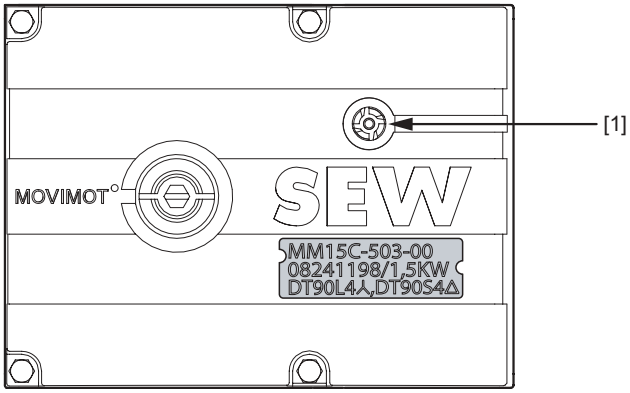
16.2 Error list

Error code/designation		Response	Cause	Action
10	**IPOS ILLOP**	IPOS program stop DO = 0	• Fault in IPOS program, see IPOS variable H469 for more information	• Correct the IPOS program, load and reset
14	**Encoder fault**	Stop of communication to MOVIMOT® DO = 0	• Interruption of one or both connections to proximity encoder NV26	• Check the electrical connection between MQ.. and NV26.
17	**Stack overflow**		• Inverter electronics is faulted, possibly due to EMC influence	• Check grounding and shielding and improve, if necessary • If the fault occurs again, contact SEW service
18	**Stack underflow**			
19	**NMI**			
20	**Undefined Opcode**			
21	**Protection fault**			
22	**Illegal word operand access**			
23	**Illegal instruction access**			
24	**Illegal external bus access**			
25	**EEPROM**		• Fault when accessing EEPROM	• Call up the factory setting "Delivery state," perform a reset and set parameters again (Caution: The IPOS program will be deleted) • If the fault occurs again, contact SEW service
28	**Fieldbus timeout**	Process output data = 0 DO = 0 (disengageable)	• No master-slave communication took place within the configured response monitoring period	• Check master communication routine
32	**IPOS Index Overflow**	IPOS program stop DO = 0	• Basic programming rules violated causing stack overflow in system	• Check IPOS user program and correct if necessary
37	**Watchdog fault**	Stop of communication to MOVIMOT® DO = 0	• Fault in system software procedure	• Contact SEW Service for advice
41	**Watchdog option**		• IPOS Watchdog, IPOS program execution time is longer than adjusted Watchdog time	• Check the time specified in the "_WdOn()" command
45	**Initialization fault**		• Fault after self-test in reset	• Perform reset. If the fault occurs again, contact SEW service.
77	**Invalid IPOS control word**	IPOS program stop DO = 0	• An attempt was made to set an invalid automatic mode	• Check write values of external control
83	**Short circuit output**	No	• DO0, DO1 or the voltage supply of the VO24 sensors is shorted	• Check the cabling/load of the DO0 and DO1 outputs as well as the voltage supplies of the sensors.
91	**System fault**	None	• One or several stations (MOVIMOT®) could not be addressed by the MQ.. within the timeout interval.	• Check voltage supply and RS-485 cabling. • Check addresses of configured stations.
97	**Copy data**	Stop of communication to MOVIMOT® DO = 0	• A fault occurred while the data record was being copied. The data is not consistent	• Try again to copy the data or perform the factory setting "Delivery state" and a reset first.

17 MOVIMOT® Diagnostics

17.1 Status LED

The status LED is located on the top of the MOVIMOT® terminal box cover (see the following figure).



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[1] MOVIMOT® status LED

Meaning of the status LED states

The three-color LED signals the operating and fault states.

LED color	LED status	Operational status	Description
–	Off	Not ready	No 24 V power supply
Yellow	Steady flashing	Not ready	Self-test phase active or 24 V power supply present but supply voltage not OK
Yellow	Steady, fast flashing	Ready	Releasing the brake without active drive enable (only with S2/2 = "ON")
Yellow	Steady light	Ready, but unit is inhibited	24 V power supply and supply voltage OK, but no enable signal
Green/yellow	Flashing with alternating colors	Ready, but timeout	Faulty communication with cyclical data exchange
Green	Steady light	Unit enabled	Motor in operation
Green	Steady, fast flashing	Current limit active	Drive has reached the current limit
Red	Steady light	Not ready	Check the 24 V_{DC} supply Make sure that there is a smoothed DC voltage with low ripple (residual ripple max. 13%) present
Red	2 x flash, pause	Fault 07	DC link voltage too high
Red	Flashing slowly	Fault 08	Fault speed monitoring (only with S2/4="ON")
		Fault 90	Assignment of motor – inverter incorrect (e.g. MM03 – DT71D4 △)
		Fault 17 to 24, 37	CPU fault
		Fault 25, 94	EEPROM error
Red	3 x flash, pause	Fault 01	Overcurrent of output stage
		Fault 11	Excessive temperature in output stage
Red	4 x flash, pause	Fault 84	Excessive temperature in motor Incorrect assignment of motor-frequency inverter
Red	5 x flash, pause	Fault 89	Excessive temperature in brake Incorrect assignment of motor-frequency inverter
Red	6 x flash, pause	Fault 06	Mains phase fault

17.2 Table of errors

Errors	Cause / solution
Timeout of communication (motor comes to a stop without error code)	A Missing connection ⊥, RS+, RS- between MOVIMOT® and RS-485 master. Check the connection, in particular the ground, and repair. B EM interference. Check the shielding of the data cables and improve if necessary. C Incorrect type (cyclical) in acyclical protocol time between the individual messages. Messages >1 s with protocol type "cyclical." Shorten message cycle or select "acyclical."
DC link voltage too low, supply system off detected (motor stops, without fault code)	Check power cables and supply voltage for interruption. Motor restarts automatically as soon as the supply voltage reaches normal values.
Fault code 01 Overcurrent of output stage	Short circuit of inverter output. Check the connection between inverter output and motor for short circuit.
Fault code 06 Phase fault	Check power cables for phase fault. Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 07 DC link voltage too high	A Ramp time too short → Increase ramp time B Faulty connection between brake coil and braking resistor. → Check the connection between braking resistor and brake coil. Correct, if necessary. C Incorrect internal resistance of brake coil/braking resistor → Check the internal resistance of the brake coil/braking resistor (see the section "Technical Data") D Thermal overload in braking resistor → Wrong size of braking resistor selected Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 08 Speed monitoring	Speed monitoring has tripped Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 11 Thermal overload of the output stage or internal unit fault	• Clean the heat sink • Reduce the ambient temperature • Prevent heat accumulation • Reduce the load on the drive Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 17 to 24, 37 CPU fault	Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 25, 94 EEPROM error	Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 84 Thermal overload of motor	• Reduce the ambient temperature • Prevent heat accumulation • Reduce the load on the motor • Increase the speed • Check the combination of the drive and MOVIMOT® frequency inverter if the fault is signaled shortly after the first release. • The temperature monitoring in the motor (TH winding thermostat) has tripped with the use of MOVIMOT® integrated in the field distributor Z.8 and selected special function 5 → Reduce load on the motor. Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 89 Thermal overload of brake coil or brake coil defective	• Extend the set ramp time • Brake inspection (see the section "Inspection and Maintenance") • Contact SEW service • If the fault should occur shortly after the initial enable, check the combination of drive (brake coil) and MOVIMOT® frequency inverter. Reset the fault by switching off the 24 V_{DC} supply voltage or use MOVILINK®.
Fault code 91 Communications fault between fieldbus gateway and MOVIMOT®	• Check electrical connection between fieldbus gateway and MOVIMOT® (RS-485) • The fault is automatically reset after removing the cause; a reset via control word is not possible.

18 Technical Data

18.1 MFD.. DeviceNet interface

MFD electrical specification	
MFD power supply to control electronics via DeviceNet	V = 11 V25 V according to DeviceNet specification $I_E \leq 200$ mA
Input voltage for inverters and sensors (terminal 11/13)	V = +24 V +/- 25 %
Electrical isolation	DeviceNet potential and inputs/outputs DeviceNet potential and MOVIMOT®
Bus connection technology	Micro-style connector male (M12)
Binary inputs (sensors) Signal level	PLC-compatible to EN61131-2 (digital inputs type 1), Ri ≈ 3.0 kΩ, Sampling interval approx. 5 ms 15 V...+30 V "1" = Contact made / -3 V...+5 V "0" = Contact not made
Sensor power supply Rated current Internal voltage drop	24 V_{DC} to EN 61131-2 interference-voltage proof and short-circuit proof Σ 500 mA max. 1 V
Binary outputs (actuators) Signal level Rated current Leakage current Internal voltage drop	PLC-compatible to EN 61131-2, interference-voltage proof and short-circuit proof "0" = 0 V, "1" = 24 V 500 mA max. 0.2 mA max. 1 V
Cable length RS-485	30 m between MFD and MOVIMOT® if installed separately
Ambient temperature	-25...60 °C
Enclosure	IP65 (installed on MFZ.. connection module, all plug connections sealed)

DeviceNet specification	
Protocol option	Master-slave connection set with polled I/O and bit-strobe I/O
Supported baud rates	500 kbaud 250 kbaud 125 kbaud
DeviceNet cable length 500 kbaud 250 kbaud 125 kbaud	See DeviceNet specification V. 2.0 100 m 200 m 400 m
Bus termination	120 Ohm (requires external triggering)
Process data configuration without DI/DO MFD21/MFD22/MFD32	2 PD 3 PD
Process data configuration with DI/DO MFD21/MFD22	2 PD + DI/DO 3 PD + DI/DO 0 PD + DI/DO
Process data configuration with DI MFD32	2 PD + DI 3 PD + DI 0 PD + DI
Address setting	DIP switch
Process data length	DIP switch
I/O enable	DIP switch
Name of EDS file	MFD2x.eds MFD3x.eds
Name of bitmap file	MFD2x.bmp MFD3x.bmp
Name of icon file	MFD2x.ico MFD3x.ico

18.2 MQD.. DeviceNet interface

MQD electrical specification	
Power supply to MQD control electronics via DeviceNet	V = 11 V25 V according to DeviceNet specification $I_E \leq 250$ mA
Input voltage for inverters and sensors (terminal 11/13)	V = +24 V +/- 25 %
Electrical isolation	DeviceNet potential and inputs/MOVIMOT® DeviceNet potential and outputs
Bus connection technology	Micro-style connector male (M12)
Binary inputs (sensors) Signal level	PLC-compatible to EN61131-2 (digital inputs type 1), Ri ≈ 3.0 kΩ, Sampling interval about 5 ms 15 V...+30 V “1” = Contact made / -3 V...+5 V “0” = Contact not made
Sensor power supply Rated current Internal voltage drop	24 V_{DC} to EN 61131-2 interference-voltage proof and short-circuit proof Σ 500 mA max. 1 V
Binary outputs (actuators) Signal level Rated current Leakage current Internal voltage drop	PLC-compatible to EN 61131-2, interference-voltage proof and short-circuit proof "0" = 0 V, "1" = 24 V 500 mA max. 0.2 mA max. 1 V
Cable length RS-485	30 m between MQD and MOVIMOT® if installed separately
Ambient temperature	-25...60 °C
Enclosure	IP65 (installed on MFZ.. connection module, all plug connections sealed)

DeviceNet specification	
Protocol option	Master-slave connection set with polled I/O and bit-strobe I/O
Supported baud rates	500 kbaud 250 kbaud 125 kbaud
DeviceNet cable length 500 kbaud 250 kbaud 125 kbaud	See DeviceNet specification V. 2.0 100 m 200 m 400 m
Bus termination	120 Ω (connect externally)
Process data configuration	1-10 process data words with and without parameter channel (see section "Process Data Configuration")
Bit-strobe response	Checkback signal of the MQD device status via bit-strobe I/O data
Address setting	DIP switch
Process data length	DIP switch
Name of EDS files	MQD2x.eds MQD3x.eds
Name of bitmap files	MQD2x.bmp MQD3x.bmp
Name of icon files	MQD2x.ico MQD3x.ico

18.3 MFO.. CANopen interface

MFO electrical specification	
MFO electronics power supply	V = +24 V +/- 25 % $I_E \leq$ 150 mA
Electrical isolation	• CANopen potential and inputs/outputs • CANopen potential and MOVIMOT®
Input voltage for inverters and sensors (terminal 11/13)	V = +24 V +/- 25 %
Bus connection technology	Micro-style connector male (M12)
Binary inputs (sensors) Signal level	PLC-compatible to EN61131-2 (digital inputs type 1), Ri ≈ 3.0 kΩ, Sampling interval approx. 5 ms 15 V...+30 V “1” = Contact made / -3 V...+5 V “0” = Contact not made
Sensor power supply Rated current Internal voltage drop	24 V_{DC} to EN 61131-2 interference-voltage proof and short-circuit proof Σ 500 mA max. 1 V
Binary outputs (actuators) Signal level Rated current Leakage current Internal voltage drop	PLC-compatible to EN 61131-2, interference-voltage proof and short-circuit proof "0" = 0 V, "1" = 24 V 500 mA max. 0.2 mA max. 1 V
Cable length RS-485	30 m between MFO and MOVIMOT® if installed separately
Ambient temperature	-25...60 °C
Enclosure	IP65 (assembled on MFZ.. connection module, all plug connections sealed)

CANopen specification	
Protocol option	1 SDO, 1 PDO, Emergency, Lifetime
Supported baud rates	• 1 Mbaud • 500 kbaud • 250 kbaud • 125 kbaud
CANopen line length 1 Mbaud 500 kbaud 250 kbaud 125 kbaud	see CANopen specification DR(P) 303 40 m 100 m 200 m 400 m
Bus termination	120 Ω (connect externally)
Process data configuration without DI/DO MFO21/MFO22/MFO32	2PD 3PD
Process data configuration with DI/DO MFO21/MFO22	2 PD + DI/DO 3 PD + DI/DO 0 PD + DI/DO
Process data configuration with DI MFO32	2 PD + DI 3 PD + DI 0 PD + DI
Address setting	DIP switch
Process data length	DIP switch
I/O enable	DIP switch
EDS files	see the section "Startup with CANopen"

18.4 Field distributors

Technical data of MF.../Z.3., MQ.../Z.3.

MF../Z.3. MQ../Z.3.	
Ambient temperature	-25...60 °C
Enclosure	IP65 (fieldbus interface and motor connection cable attached and fastened, all plug connections sealed)
interface	PROFIBUS, InterBus, DeviceNet, CANopen, AS-i

Technical data of MF.../Z.6., MQ.../Z.6.

MF../Z.6. MQ../Z.6.	
Maintenance switch	Load disconnector and line protection Type: ABB MS 325 – 9 + HK20 Switch activation: black/red, tripple lock
Ambient temperature	-25...55 °C
Enclosure	IP65 (fieldbus interface, power supply connection cover and motor connection cable attached and fastened, all plug connections sealed)
Interface	PROFIBUS, InterBus, DeviceNet, CANopen, AS-i

MF.../MM../Z.7., MQ.../MM../Z.7. field distributors

Field distributor type		MF../MM..-503-00/Z.7 MQ../MM..-503-00/Z.7				
		MM03C	**MM05C**	**MM07C**	**MM11C**	**MM15C**
Apparent output power at V_{in} = 380...500 V	P_{rated}	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA
Connection voltages Permitted range	V_{in}	3 x 380 V_{AC} / **400 V_{AC}** / 415 V_{AC} / 460 V_{AC} / 500 V_{AC} V_{in} = 380 V_{AC} - 10%...500 V_{AC} + 10%				
Supply frequency	f_{supply}	50 Hz ... 60 Hz ± 10 %				
Rated system current (at V_{in} = 400 V_{AC})	I_{system}	1.3 A_{AC}	1.6 A_{AC}	1.9 A_{AC}	2.4 A_{AC}	3.5 A_{AC}
Output voltage	V_{out}	0... V_{in}				
Output frequency **Resolution** **Operating point**	f_{out}	2...100 Hz 0.01 Hz 400 V at 50 Hz / 100 Hz				
Output rated current	I_{rated}	1.6 A_{AC}	2.0 A_{AC}	2.5 A_{AC}	3.2 A_{AC}	4.0 A_{AC}
Motor power S1	P_{mot}	**0.37 kW**	**0.55 kW**	**0.75 kW**	**1.1 kW**	**1.5 kW**
Motor power S3 25 % cdf						
PWM frequency		4 / 8 / **16**[1] kHz				
Current limitation	I_{max}	**Motor:** 160 % with ⅄ and △ **Regenerative:**160 % with ⅄ and △				
Maximum motor lead length		15 m (with SEW hybrid cable)				
External braking resistor	R_{min}	200 Ω				
Interference immunity		meets EN 61800-3				
Interference emission		Meets EN 61800-3 and class A limit to EN 55011 and EN 55014				
Ambient temperature	ϑ_U	-25 °C...40 °C (-13 °F...104 °F) (P_{rated} reduction: 3 % I_{rated} per K to max. 60°C)				
Enclosure		IP65 (fieldbus interface, supply connection cover and motor connection cable attached and screwed, all plug connections sealed)				
Operating mode		DB (EN 60149-1-1 and 1-3), S3 max. cycle duration 10 minutes				
Type of cooling (DIN 41 751)		Self-cooling				
Altitude		h ≤ 1000 m (P_{rated} reduction: 1 % per 100 m starting at an altitude of 1000 m, see also the section –Electrical Installation – Installation Instructions" in the MOVIMOT® operating instructions)				
Ext. power supply to electronics	TI. 11 TI. 13	V = +24 V ± 25 %, EN 61131-2, residual ripple max. 13 % I_E ≤ 250 mA (only MOVIMOT®) Starting current: 1 A				
interface		PROFIBUS, InterBus, DeviceNet, CANopen, AS-i				

1 16 kHz-PWM frequency (low-noise) If DIP-SWITCH S1/7 = ON (factory setting), the equipment operates with 16 kHz PWM frequency (low-noise) and incrementally switches back to a lower clock frequency dependent upon the heat sink temperature.

MF../MM../Z.8., MQ../MM../Z.8. field distributors

Field distributor type		MF../MM..-503-00/Z.8 MQ../MM..-503-00/Z.8							
		MM03C	**MM05C**	**MM07C**	**MM11C**	**MM15C**	**MM22C**	**MM30C**	**MM3XC**
Apparent output power at V_{in} = 380...500 V	P_{rated}	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA	3.8 kVA	5.1 kVA	6.7 kVA
Connection voltages Permitted range	V_{in}	3 x 380 V_{AC} / **400 V_{AC}** / 415 V_{AC} / 460 V_{AC} / 500 V_{AC} V_{in} = 380 V_{AC} - 10%...500 V_{AC} + 10%							
Supply frequency	f_{supply}	50 Hz ... 60 Hz ± 10 %							
Rated system current (at V_{in} = 400 V_{AC})	$I_{sys-tem}$	1.3 A_{AC}	1.6 A_{AC}	1.9 A_{AC}	2.4 A_{AC}	3.5 A_{AC}	5.0 A_{AC}	6.7 A_{AC}	8.6 A_{AC}
Output voltage	V_{out}	0... V_{in}							
Output frequency Resolution Operating point	f_{out}	2...100 Hz 0.01 Hz 400 V at 50 Hz / 100 Hz							
Output rated current	I_{rated}	1.6 A_{AC}	2.0 A_{AC}	2.5 A_{AC}	3.2 A_{AC}	4.0 A_{AC}	5.5 A_{AC}	7.3 A_{AC}	9.6 A_{AC}
Motor power S1	P_{mot}	**0.37 kW**	**0.55 kW**	**0.75 kW**	**1.1 kW**	**1.5 kW**	**2.2 kW**	**3.0 kW**	**3.0 kW**
Motor power S3 25 % cdf									**4.0 kW**
PWM frequency		4 / 8 / **16**[1] kHz							
Current limitation	I_{max}	**Motor:** 160 % with ⅄ and △ **Regenerative:**160 % with ⅄ and △							
Maximum motor lead length		15 m (with SEW hybrid cable)							
External braking resistor	R_{min}	200 Ω					100 Ω		
Interference immunity		meets EN 61800-3							
Interference emission		Meets EN 61800-3 and class A limit to EN 55011 and EN 55014							
Ambient temperature	ϑ_U	-25 °C...40 °C (-13 °F...104 °F) (P_{rated} reduction: 3 % I_{rated} per K to max. 55 °C)							[2]
Enclosure		IP65 (fieldbus interface, supply connection cover and motor connection cable attached and screwed, all plug connections sealed)							
Operating mode		DB (EN 60149-1-1 and 1-3), S3 max. cycle duration 10 minutes							
Type of cooling (DIN 41 751)		Self-cooling							
Altitude		h ≤ 1000 m (P_{rated} reduction: 1 % per 100 m starting at an altitude of 1000 m, see also the section –Electrical Installation – Installation Instructions" in the MOVIMOT® operating instructions)							
Ext. power supply to electronics	Tl. 11 Tl. 13	V = +24 V ± 25 %, EN 61131-2, residual ripple max. 13 % I_E ≤ 250 mA (only MOVIMOT®) Starting current: 1 A							
Maintenance switch		Load interrupter switch Type: ABB OT16ET3HS3ST1 Switch activation: black/red, tripple lockable							
interface		PROFIBUS, InterBus, DeviceNet, CANopen, AS-i							

1 16 kHz-PWM frequency (low-noise) If DIP-SWITCH S1/7 = ON (factory setting), the equipment operates with 16 kHz PWM frequency (low-noise) and incrementally switches back to a lower clock frequency dependent upon the heat sink temperature.

2 -25 °C...40 °C with S3 25% cdf (up to 55 °C with S3 10 % cdf)

18.5 Statement of Conformance for MFD2x DeviceNet Interface

DeviceNet — **Statement of Conformance**

SOC data as of 3 - 24 - 2000

		Fill in the blank or	**X**	**the appropriate box**		
General Device Data	Conforms to DeviceNet Specification	Volume I - Release	*2*	Volume II - Release	*2*	
	Vendor Name	*SEW Eurodrive GmbH*				
	Device Profile Name	*Vendor Specific*				
	Product Name	*SEW-MOVIMOT-MFD 2x*				
	Product Catalog Number	*6*				
	Product Revision	*1,01*				
DeviceNet Physical Conformance Data	Network Power Consumption (Max)	*0,4 A @ 11V dc (worst case)*				
	Connector Style	Open-Hardwired	☐	Sealed-Mini	☐	
		Open-Pluggable	☐	Sealed-Micro	X	
	Isolated Physical Layer	Yes	☐			
		No	X			
	LEDs Supported	Module	☐	Combo Mod/Net	X	
	None ☐	Network	☐	I/O	☐	
	MAC ID Setting	DIP Switch	X	Software Settable	☐	
		Other				
	Default MAC ID	*63*				
	Communication Rate Setting	DIP Switch	X	Software Settable	☐	
		Other				
	Communication Rates Supported	125k bit/s	X	500k bit/s	X	
		250k bit/s	X			
DeviceNet Communication Data	Device Network Behavior	Group 2 Client	☐	Group 2 Only Client	☐	
	Check All That Apply	Group 2 Server	☐	Group 2 Only Server	X	
		Peer-To-Peer	☐	Tool (not a Device)	☐	
	UCMM Explicit Message Groups Supported	Group 1	☐	Group 2 ☐	Group 3	☐
	Dynamic I/O Message Groups (Peer to Peer)	Group 1	☐	Group 2 ☐	Group 3	☐
	Default I/O Data Address Path	Input: Class	*4*	Inst. *64*	Attr.	*3*
		Output: Class	*4*	Inst. *64*	Attr.	*3*
	Fragmented Explicit Messaging Supported	Yes	X	No		☐
	If yes, Acknowledge TimeOut	*1000 ms*				
	Typical Target Addresses					
	Consumption Service *16*	Class	*1*	Inst. *1*	Attr.	*7*
	Production Service *14*	Class	*1*	Inst. *1*	Attr.	*7*

03333BXX

DeviceNet Statement of Conformance

DeviceNet	Identity Object 0x01					
Required Object Implementation	**Object Class**	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	Revision	☐	☐	
		2	Max instance	☐	☐	
	[X] None Supported	3	Number of Instances	☐	☐	
		4	Optional attributes list	☐	☐	
		5	Optional services list	☐	☐	
		6	Max Id of class attributes	☐	☐	
		7	Max Id of instance attributes	☐	☐	
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attributes_All			
		☐	Reset			
	[X] None Supported	☐	Get_Attribute_Single			
		☐	Find_Next_Object_instance			
	Object Instance	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	Vendor	[X]	☐	*=(315)*
		2	Device type	[X]	☐	*=(100)*
		3	Product code	[X]	☐	*=(6)*
		4	Revision	[X]	☐	*=(1.01)*
		5	Status (bits supported)	[X]	☐	
		6	Serial number	[X]	☐	*=(8234590)*
		7	Product name	[X]	☐	*SEW-MOVIMOT-MFD 2x*
		8	State	☐	☐	
		9	Config. Consistency Value	☐	☐	
		10	Heartbeat Interval	☐	☐	
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attributes_All			
		[X]	Reset	*0*		
		[X]	Get_Attribute_Single			
		☐	Set_Attribute_Single			
	Vendor Specific Additions	If yes, fill out the Vendor Specific Additions form on page F-7.		Yes	☐	
				No	[X]	

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.

[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03334BXX

DeviceNet Statement of Conformance

DeviceNet	Message Router Object 0x02					
Required	**Object Class**	**ID**	**Description**	**Get**	**Set**	**Value Limits**
Object Implementation	Attributes Open	1	Revision	☐	☐	
		4	Optional attribute list	☐	☐	
	[X] None Supported	5	Optional service list	☐	☐	
		6	Max ID of class attributes	☐	☐	
		7	Max ID of instance attributes	☐	☐	
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attributes_All			
		☐	Get_Attribute_Single			
	[X] None Supported					
	Object Instance	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	Object list	☐	☐	
		2	Maximum connections supported	☐	☐	
	[X] None Supported	3	Number of active connections	☐	☐	
		4	Active connections list	☐	☐	
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attributes_All			
		☐	Get_Attribute_Single			
	[X] None Supported					
	Vendor Specific Additions	If yes, fill out the Vendor Specific		Yes	☐	
		Additions form on page F-7.		No	[X]	

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.
[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03335BXX

DeviceNet Statement of Conformance

DeviceNet Required Object Implementation	DeviceNet Object 0x03					
	Object Class	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	Revision	X	☐	=(2)
	☐ None Supported					
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attribute_Single			
	X None Supported					
	Object Instance	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	MAC ID	X	☐	=(0..63)
		2	Baud rate	X	☐	=(0..2)
	☐ None Supported	3	BOI	X	☐	=(0)
		4	Bus-off counter	X	X	=(0..255)
		5	Allocation information	X	☐	
		6	MAC ID switch changed	X	☐	=(0)
		7	Baud rate switch changed	X	☐	=(0)
		8	MAC ID switch value	X	☐	=(0..63)
		9	Baud rate switch value	X	☐	=(0..2)
		DeviceNet Services		**Parameter Options**		
	Services	X	Get_Attribute_Single			
		X	Set_Attribute_Single			
	☐ None Supported	X	Allocate M/S connection set			
		X	Release M/S connection set			
	Vendor Specific Additions	If yes, fill out the Vendor Specific		Yes	☐	
		Additions form on page F-7.		No	X	

X **Get** indicates attribute value is returned by the Get_Attribute_Single service.

X **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03336BXX

DeviceNet Statement of Conformance

Connection Object 0x05

DeviceNet						
Required Object Implementation	Object Class	ID	Description	Get	Set	Value Limits
	Attributes Open	1	Revision	☐	☐	
	☒ None Supported					

	DeviceNet Services	Parameter Options
Services	☐ Reset	
	☐ Create	
☒ None Supported	☐ Delete	
	☐ Get_Attribute_Single	
	☐ Find_Next_Object_Instance	

Object Instance	Predefined M/S Connections		Peer to Peer Connections		Max Instances
Complete the Object Instance section for each Instance type supported. Indicate Production trigger, Transport type and Transport Class supported for Dynamic I/O.	Explicit Message	☒	Explicit Message	☐	Total
	Polled	☐		Server	Client
	Bit Strobed	☐	Dynamic I/O	☐	Total
	Change of State	☐		Server	Client
	Cyclic	☐			

Production trigger(s)	Cyclic	☐	COS	☐	App. trig.	☐
Transport type(s)	Server	☒			Client	☐
Transport class(es)		☐	2	☒	3	☐

	ID	Description	Get	Set	Value Limits
Attributes Open	1	State	☒	☐	
	2	Instance type	☒	☐	
	3	Transport Class trigger	☒	☐	
	4	Produced connection ID	☒	☐	
	5	Consumed connection ID	☒	☐	
	6	Initial comm. characteristics	☒	☐	
	7	Produced connection size	☒	☐	
	8	Consumed connection size	☒	☐	
	9	Expected packet rate	☒	☒	=(0..65530)
	12	Watchdog time-out action	☒	☐	
	13	Produced connection path length	☒	☐	
	14	Produced connection path	☒	☐	
	15	Consumed connection path length	☒	☐	
	16	Consumed connection path	☒	☐	
	17	Production inhibit time	☒	☐	=(0)

	DeviceNet Services	Parameter Options
Services	☒ Reset	
	☐ Delete	
	☐ Apply_Attributes	
	☒ Get_Attribute_Single	
	☒ Set_Attribute_Single	

Vendor Specific Additions	If yes, fill out the Vendor Specific	Yes	☐
	Additions form on page F-7.	No	☒

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.

☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03337BXX

DeviceNet Statement of Conformance

Connection Object 0x05

DeviceNet Required Object Implementation

Object Class	ID	Description	Get	Set	Value Limits
Attributes Open	1	Revision	☐	☐	
[X] None Supported					

DeviceNet Services	Parameter Options
Services	☐ Reset
	☐ Create
[X] None Supported	☐ Delete
	☐ Get_Attribute_Single
	☐ Find_Next_Object_Instance

Object Instance	Predefined M/S Connections		Peer to Peer Connections		Max Instances
Complete the Object Instance section	Explicit Message	☐	Explicit Message	☐	Total
for each Instance type supported.	Polled	[X]		Server	Client
Indicate Production trigger,	Bit Strobed	☐	Dynamic I/O	☐	Total
Transport type and Transport	Change of State	☐		Server	Client
Class supported for Dynamic I/O.	Cyclic	☐			

Production trigger(s)	Cyclic	☐	COS	☐	App. trig.	☐
Transport type(s)	Server	[X]			Client	☐
Transport class(es)		☐	2	[X]	3	☐

Attributes Open	ID	Description	Get	Set	Value Limits
	1	State	[X]	☐	
	2	Instance type	[X]	☐	
	3	Transport Class trigger	[X]	☐	
	4	Produced connection ID	[X]	☐	
	5	Consumed connection ID	[X]	☐	
	6	Initial comm. characteristics	[X]	☐	
	7	Produced connection size	[X]	☐	
	8	Consumed connection size	[X]	☐	
	9	Expected packet rate	[X]	[X]	=(0..65530)
	12	Watchdog time-out action	[X]	☐	
	13	Produced connection path length	[X]	☐	
	14	Produced connection path	[X]	☐	
	15	Consumed connection path length	[X]	☐	
	16	Consumed connection path	[X]	☐	
	17	Production inhibit time	[X]	☐	=(0)

DeviceNet Services	Parameter Options
Services	[X] Reset
	☐ Delete
	☐ Apply_Attributes
	[X] Get_Attribute_Single
	[X] Set_Attribute_Single

Vendor Specific Additions			
	If yes, fill out the Vendor Specific	Yes	☐
	Additions form on page F-7.	No	[X]

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.

[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03338BXX

DeviceNet Statement of Conformance

Connection Object 0x05

DeviceNet Required Object Implementation

Object Class		ID	Description	Get	Set	Value Limits
Attributes	Open	1	Revision	☐	☐	
☒ None Supported						

DeviceNet Services		Parameter Options
Services	☐	Reset
	☐	Create
☒ None Supported	☐	Delete
	☐	Get_Attribute_Single
	☐	Find_Next_Object_Instance

Object Instance	Predefined M/S Connections		Peer to Peer Connections		Max Instances
Complete the Object Instance section for each Instance type supported. Indicate Production trigger, Transport type and Transport Class supported for Dynamic I/O.	Explicit Message	☐	Explicit Message	☐	Total
	Polled	☐		Server	Client
	Bit Strobed	☒	Dynamic I/O	☐	Total
	Change of State	☐		Server	Client
	Cyclic	☐			

Production trigger(s)	Cyclic	☐	COS	☐	App. trig.	☐
Transport type(s)	Server	☒			Client	☐
Transport class(es)		☐	2	☒	3	☐

	ID	Description	Get	Set	Value Limits
Attributes Open	1	State	☒	☐	
	2	Instance type	☒	☐	
	3	Transport Class trigger	☒	☐	
	4	Produced connection ID	☒	☐	
	5	Consumed connection ID	☒	☐	
	6	Initial comm. characteristics	☒	☐	
	7	Produced connection size	☒	☐	
	8	Consumed connection size	☒	☐	
	9	Expected packet rate	☒	☒	*=(0..65530)*
	12	Watchdog time-out action	☒	☐	
	13	Produced connection path length	☒	☐	
	14	Produced connection path	☒	☐	
	15	Consumed connection path length	☒	☐	
	16	Consumed connection path	☒	☐	
	17	Production inhibit time	☒	☐	*=(0)*

DeviceNet Services		Parameter Options
Services	☒	Reset
	☐	Delete
	☐	Apply_Attributes
	☒	Get_Attribute_Single
	☒	Set_Attribute_Single

Vendor Specific Additions			
If yes, fill out the Vendor Specific Additions form on page F-7.	Yes	☐	
	No	☒	

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.

☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03339BXX

DeviceNet Statement of Conformance

DeviceNet	Register Object 0x07					
Required Object Implementation	**Object Class**		**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes	Open	1	Revision	☐	☐	
	☒ None Supported						
			DeviceNet Services		**Parameter Options**		
	Services		☐	Get_Attribute_Single			
	☒ None Supported						
	Object Instance		**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes	Open	1	Bad Flag	☒	☐	
			2	Direction	☒	☐	
	☐ None Supported		3	Size	☒	☐	*=(16,48)*
			4	Data	☒	☒	
			DeviceNet Services		**Parameter Options**		
	Services		☒	Get_Attribute_Single	*8452*		
	☐ None Supported		☒	Set_Attribute_Single			
	Vendor Specific Additions		If yes, fill out the Vendor Specific Additions form on page F-7.		Yes	☐	
					No	☒	

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.
☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03340BXX

DeviceNet Statement of Conformance

Parameter Object 0x0F

DeviceNet Required Object Implementation		ID	Description	Get	Set	Value Limits
Object Class						
Attributes	Open	1	Revision	☐	☐	
		2	Max instance	☒	☐	
☐ None Supported		8	Parameter class descriptor	☒	☐	
		9	Configuration assembly instance	☒	☐	
		10	Native language	☐	☐	
		DeviceNet Services		**Parameter Options**		
Services		☐	Get_Attributes_All			
		☐	Reset			
☐ None Supported		☒	Get_Attribute_Single			
		☐	Set_Attribute_Single			
		☐	Restore			
		☐	Save			
Object Instance		**ID**	**Description**	**Get**	**Set**	**Value Limits**
Attributes	Open	1	Parameter value	☒	☒	*=(0..4294967294)*
		2	Link Path size	☒	☐	
☐ None Supported		3	Link path	☒	☐	
		4	Descriptor	☒	☐	
		5	Data type	☒	☐	
		6	Data size	☒	☐	*=(4)*
		7	Parameter name string	☐	☐	
		8	Units string	☐	☐	
		9	Help string	☐	☐	
		10	Minimum value	☐	☐	
		11	Maximum value	☐	☐	
		12	Default value	☐	☐	
		13	Scaling multiplier	☐	☐	
		14	Scaling divisor	☐	☐	
		15	Scaling base	☐	☐	
		16	Scaling offset	☐	☐	
		17	Multiplier link	☐	☐	
		18	Divisor link	☐	☐	
		19	Base link	☐	☐	
		20	Offset link	☐	☐	
		21	Decimal precision	☐	☐	
		DeviceNet Services		**Parameter Options**		
Services		☐	Get_Attribute_All			
☐ None Supported		☒	Get_Attribute_Single			
		☒	Set_Attribute_Single			
Vendor Specific Additions		If yes, fill out the Vendor Specific Additions form on page F-7.		Yes	☐	
				No	☒	

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.
☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03341BXX

18.6 Statement of Conformance for MFD3X DeviceNet Interface

DeviceNet — **Statement of Conformance**

SOC data as of 3 - 21 - 2000

		Fill in the blank or [X] the appropriate box			
General Device Data	Conforms to DeviceNet Specification	Volume I - Release	*2*	Volume II - Release	*2*
	Vendor Name	*SEW Eurodrive GmbH*			
	Device Profile Name	*Vendor Specific*			
	Product Name	*SEW-MOVIMOT-MFD 3x*			
	Product Catalog Number	*5*			
	Product Revision	*1,01*			
DeviceNet Physical Conformance Data	Network Power Consumption (Max)	*0,4 A @ 11V dc (worst case)*			
	Connector Style	Open-Hardwired	[ ]	Sealed-Mini	[ ]
		Open-Pluggable	[ ]	Sealed-Micro	[X]
	Isolated Physical Layer	Yes	[ ]		
		No	[X]		
	LEDs Supported	Module	[ ]	Combo Mod/Net	[X]
	None [ ]	Network	[ ]	I/O	[ ]
	MAC ID Setting	DIP Switch	[X]	Software Settable	[ ]
		Other			
	Default MAC ID	*63*			
	Communication Rate Setting	DIP Switch	[X]	Software Settable	[ ]
		Other			
	Communication Rates Supported	125k bit/s	[X]	500k bit/s	[X]
		250k bit/s	[X]		
DeviceNet Communication Data	Device Network Behavior	Group 2 Client	[ ]	Group 2 Only Client	[ ]
	Check All That Apply	Group 2 Server	[ ]	Group 2 Only Server	[X]
		Peer-To-Peer	[ ]	Tool (not a Device)	[ ]
	UCMM Explicit Message Groups Supported	Group 1	[ ]	Group 2 [ ]	Group 3 [ ]
	Dynamic I/O Message Groups (Peer to Peer)	Group 1	[ ]	Group 2 [ ]	Group 3 [ ]
	Default I/O Data Address Path	Input: Class	*4*	Inst. *64*	Attr. *3*
		Output: Class	*4*	Inst. *64*	Attr. *3*
	Fragmented Explicit Messaging Supported	Yes	[X]	No	[ ]
	If yes, Acknowledge TimeOut	*1000 ms*			
	Typical Target Addresses				
	Consumption Service *16*	Class	*1*	Inst. *1*	Attr. *7*
	Production Service *14*	Class	*1*	Inst. *1*	Attr. *7*

03216BXX

DeviceNet Statement of Conformance

Identity Object 0x01

DeviceNet Required Object Implementation		ID	Description	Get	Set	Value Limits
Object Class						
Attributes	Open	1	Revision	☐	☐	
		2	Max instance	☐	☐	
[X] None Supported		3	Number of Instances	☐	☐	
		4	Optional attributes list	☐	☐	
		5	Optional services list	☐	☐	
		6	Max Id of class attributes	☐	☐	
		7	Max Id of instance attributes	☐	☐	

	DeviceNet Services	Parameter Options
Services	☐ Get_Attributes_All	
	☐ Reset	
[X] None Supported	☐ Get_Attribute_Single	
	☐ Find_Next_Object_instance	

Object Instance		ID	Description	Get	Set	Value Limits
Attributes	Open	1	Vendor	[X]	☐	*=(315)*
		2	Device type	[X]	☐	*=(100)*
		3	Product code	[X]	☐	*=(5)*
		4	Revision	[X]	☐	*=(1.01)*
		5	Status (bits supported)	[X]	☐	
		6	Serial number	[X]	☐	*=(8234590)*
		7	Product name	[X]	☐	*SEW-MOVIMOT-MFD 3x*
		8	State	☐	☐	
		9	Config. Consistency Value	☐	☐	
		10	Heartbeat Interval	☐	☐	

	DeviceNet Services	Parameter Options
Services	☐ Get_Attributes_All	
	[X] Reset	*0*
	[X] Get_Attribute_Single	
	☐ Set_Attribute_Single	

Vendor Specific Additions	If yes, fill out the Vendor Specific Additions form on page F-7.	Yes	☐
		No	[X]

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.

[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03217BXX

DeviceNet Statement of Conformance

DeviceNet	Message Router Object 0x02					
Required	**Object Class**	**ID**	**Description**	**Get**	**Set**	**Value Limits**
Object Implementation	Attributes Open	1	Revision	☐	☐	
		4	Optional attribute list	☐	☐	
	[X] None Supported	5	Optional service list	☐	☐	
		6	Max ID of class attributes	☐	☐	
		7	Max ID of instance attributes	☐	☐	
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attributes_All			
		☐	Get_Attribute_Single			
	[X] None Supported					
	Object Instance	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	Object list	☐	☐	
		2	Maximum connections supported	☐	☐	
	[X] None Supported	3	Number of active connections	☐	☐	
		4	Active connections list	☐	☐	
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attributes_All			
		☐	Get_Attribute_Single			
	[X] None Supported					
	Vendor Specific Additions	If yes, fill out the Vendor Specific		Yes	☐	
		Additions form on page F-7.		No	[X]	

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.
[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03218BXX

DeviceNet Statement of Conformance

DeviceNet Required Object Implementation	DeviceNet Object 0x03					
	Object Class	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	Revision	X		=(2)
	☐ None Supported					
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attribute_Single			
	X None Supported					
	Object Instance	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	MAC ID	X		=(0..63)
		2	Baud rate	X		=(0..2)
	☐ None Supported	3	BOI	X		=(0)
		4	Bus-off counter	X	X	=(0..255)
		5	Allocation information	X		
		6	MAC ID switch changed	X		=(0)
		7	Baud rate switch changed	X		=(0)
		8	MAC ID switch value	X		=(0..63)
		9	Baud rate switch value	X		=(0..2)
		DeviceNet Services		**Parameter Options**		
	Services	X	Get_Attribute_Single			
		X	Set_Attribute_Single			
	☐ None Supported	X	Allocate M/S connection set			
		X	Release M/S connection set			
	Vendor Specific Additions	If yes, fill out the Vendor Specific		Yes	☐	
		Additions form on page F-7.		No	X	

X **Get** indicates attribute value is returned by the Get_Attribute_Single service.

X **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03219BXX

DeviceNet Statement of Conformance

Connection Object 0x05

DeviceNet Required Object Implementation						
Object Class		**ID**	**Description**	**Get**	**Set**	**Value Limits**
Attributes	Open	1	Revision	☐	☐	
☒ None Supported						

	DeviceNet Services	**Parameter Options**
Services	☐ Reset	
	☐ Create	
☒ None Supported	☐ Delete	
	☐ Get_Attribute_Single	
	☐ Find_Next_Object_Instance	

Object Instance	**Predefined M/S Connections**		**Peer to Peer Connections**		**Max Instances**
Complete the Object Instance section for each Instance type supported. Indicate Production trigger, Transport type and Transport Class supported for Dynamic I/O.	Explicit Message	☒	Explicit Message	☐	Total
	Polled	☐	Server		Client
	Bit Strobed	☐	Dynamic I/O	☐	Total
	Change of State	☐	Server		Client
	Cyclic	☐			

Production trigger(s)	Cyclic	☐	COS	☐	App. trig.	☐
Transport type(s)	Server	☒			Client	☐
Transport class(es)		☐	2	☒	3	☐

	ID	**Description**	**Get**	**Set**	**Value Limits**
Attributes Open	1	State	☒	☐	
	2	Instance type	☒	☐	
	3	Transport Class trigger	☒	☐	
	4	Produced connection ID	☒	☐	
	5	Consumed connection ID	☒	☐	
	6	Initial comm. characteristics	☒	☐	
	7	Produced connection size	☒	☐	
	8	Consumed connection size	☒	☐	
	9	Expected packet rate	☒	☒	*=(0..65530)*
	12	Watchdog time-out action	☒	☐	
	13	Produced connection path length	☒	☐	
	14	Produced connection path	☒	☐	
	15	Consumed connection path length	☒	☐	
	16	Consumed connection path	☒	☐	
	17	Production inhibit time	☒	☐	*=(0)*

	DeviceNet Services	**Parameter Options**
Services	☒ Reset	
	☐ Delete	
	☐ Apply_Attributes	
	☒ Get_Attribute_Single	
	☒ Set_Attribute_Single	

Vendor Specific Additions	If yes, fill out the Vendor Specific	Yes	☐
	Additions form on page F-7.	No	☒

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.
☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03220BXX

Device **Net** — Statement of Conformance

DeviceNet Required Object Implementation

Connection Object 0x05

Object Class		ID	Description	Get	Set	Value Limits
Attributes	Open	1	Revision	[ ]	[ ]	
[X] None Supported						

	DeviceNet Services	Parameter Options
Services	[ ] Reset	
	[ ] Create	
[X] None Supported	[ ] Delete	
	[ ] Get_Attribute_Single	
	[ ] Find_Next_Object_Instance	

Object Instance

Complete the Object Instance section for each Instance type supported. Indicate Production trigger, Transport type and Transport Class supported for Dynamic I/O.

Predefined M/S Connections		Peer to Peer Connections		Max Instances
Explicit Message	[ ]	Explicit Message	[ ]	Total
Polled	[X]	Server		Client
Bit Strobed	[ ]	Dynamic I/O	[ ]	Total
Change of State	[ ]	Server		Client
Cyclic	[ ]			

Production trigger(s)	Cyclic	[ ]	COS	[ ]	App. trig.	[ ]
Transport type(s)	Server	[X]			Client	[ ]
Transport class(es)		[ ]	2	[X]	3	[ ]

		ID	Description	Get	Set	Value Limits
Attributes	Open	1	State	[X]	[ ]	
		2	Instance type	[X]	[ ]	
		3	Transport Class trigger	[X]	[ ]	
		4	Produced connection ID	[X]	[ ]	
		5	Consumed connection ID	[X]	[ ]	
		6	Initial comm. characteristics	[X]	[ ]	
		7	Produced connection size	[X]	[ ]	
		8	Consumed connection size	[X]	[ ]	
		9	Expected packet rate	[X]	[X]	*=(0..65530)*
		12	Watchdog time-out action	[X]	[ ]	
		13	Produced connection path length	[X]	[ ]	
		14	Produced connection path	[X]	[ ]	
		15	Consumed connection path length	[X]	[ ]	
		16	Consumed connection path	[X]	[ ]	
		17	Production inhibit time	[X]	[ ]	*=(0)*

	DeviceNet Services	Parameter Options
Services	[X] Reset	
	[ ] Delete	
	[ ] Apply_Attributes	
	[X] Get_Attribute_Single	
	[X] Set_Attribute_Single	

Vendor Specific Additions	If yes, fill out the Vendor Specific	Yes	[ ]
	Additions form on page F-7.	No	[X]

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.
[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03221BXX

DeviceNet Statement of Conformance

DeviceNet Required Object Implementation

Connection Object 0x05

Object Class	ID	Description	Get	Set	Value Limits
Attributes Open	1	Revision	☐	☐	
☒ None Supported					

DeviceNet Services		Parameter Options
Services	☐	Reset
	☐	Create
☒ None Supported	☐	Delete
	☐	Get_Attribute_Single
	☐	Find_Next_Object_Instance

Object Instance	Predefined M/S Connections		Peer to Peer Connections		Max Instances
Complete the Object Instance section for each Instance type supported. Indicate Production trigger, Transport type and Transport Class supported for Dynamic I/O.	Explicit Message	☐	Explicit Message	☐	Total
	Polled	☐		Server	Client
	Bit Strobed	☒	Dynamic I/O	☐	Total
	Change of State	☐		Server	Client
	Cyclic	☐			

Production trigger(s)	Cyclic	☐	COS	☐	App. trig.	☐
Transport type(s)	Server	☒			Client	☐
Transport class(es)		☐	2	☒	3	☐

Attributes Open	ID	Description	Get	Set	Value Limits
	1	State	☒	☐	
	2	Instance type	☒	☐	
	3	Transport Class trigger	☒	☐	
	4	Produced connection ID	☒	☐	
	5	Consumed connection ID	☒	☐	
	6	Initial comm. characteristics	☒	☐	
	7	Produced connection size	☒	☐	
	8	Consumed connection size	☒	☐	
	9	Expected packet rate	☒	☒	*=(0..65530)*
	12	Watchdog time-out action	☒	☐	
	13	Produced connection path length	☒	☐	
	14	Produced connection path	☒	☐	
	15	Consumed connection path length	☒	☐	
	16	Consumed connection path	☒	☐	
	17	Production inhibit time	☒	☐	*=(0)*

DeviceNet Services		Parameter Options
Services	☒	Reset
	☐	Delete
	☐	Apply_Attributes
	☒	Get_Attribute_Single
	☒	Set_Attribute_Single

Vendor Specific Additions			
If yes, fill out the Vendor Specific Additions form on page F-7.	Yes	☐
	No	☒

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.

☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03222BXX

DeviceNet Statement of Conformance

DeviceNet	Register Object 0x07					
Required	**Object Class**	**ID**	**Description**	**Get**	**Set**	**Value Limits**
Object Implementation	Attributes Open	1	Revision	☐	☐	
	☒ None Supported					
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attribute_Single			
	☒ None Supported					
	Object Instance	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	Bad Flag	☒	☐	
		2	Direction	☒	☐	
	☐ None Supported	3	Size	☒	☐	*=(16,48)*
		4	Data	☒	☒	
		DeviceNet Services		**Parameter Options**		
	Services	☒	Get_Attribute_Single	*8452*		
	☐ None Supported	☒	Set_Attribute_Single			
	Vendor Specific Additions	If yes, fill out the Vendor Specific		Yes	☐	
		Additions form on page F-7.		No	☒	

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.
☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03223BXX

DeviceNet Statement of Conformance

Parameter Object 0x0F

DeviceNet Required Object Implementation

Object Class		ID	Description	Get	Set	Value Limits
Attributes	Open	1	Revision	☐	☐	
		2	Max instance	☒	☐	
☐ None Supported		8	Parameter class descriptor	☒	☐	
		9	Configuration assembly instance	☒	☐	
		10	Native language	☐	☐	

	DeviceNet Services	Parameter Options
Services	☐ Get_Attributes_All	
	☐ Reset	
☐ None Supported	☒ Get_Attribute_Single	
	☐ Set_Attribute_Single	
	☐ Restore	
	☐ Save	

Object Instance		ID	Description	Get	Set	Value Limits
Attributes	Open	1	Parameter value	☒	☒	*=(0..4294967294)*
		2	Link Path size	☒	☐	
☐ None Supported		3	Link path	☒	☐	
		4	Descriptor	☒	☐	
		5	Data type	☒	☐	
		6	Data size	☒	☐	*=(4)*
		7	Parameter name string	☐	☐	
		8	Units string	☐	☐	
		9	Help string	☐	☐	
		10	Minimum value	☐	☐	
		11	Maximum value	☐	☐	
		12	Default value	☐	☐	
		13	Scaling multiplier	☐	☐	
		14	Scaling divisor	☐	☐	
		15	Scaling base	☐	☐	
		16	Scaling offset	☐	☐	
		17	Multiplier link	☐	☐	
		18	Divisor link	☐	☐	
		19	Base link	☐	☐	
		20	Offset link	☐	☐	
		21	Decimal precision	☐	☐	

	DeviceNet Services	Parameter Options
Services	☐ Get_Attribute_All	
☐ None Supported	☒ Get_Attribute_Single	
	☒ Set_Attribute_Single	

Vendor Specific Additions	If yes, fill out the Vendor Specific Additions form on page F-7.	Yes	☐
		No	☒

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.
☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

03224BXX

18.7 Statement of Conformance for MQD2X DeviceNet Interface

DeviceNet — Statement of Conformance

SOC data as of 2 - 14 - 2003

		Fill in the blank or [X] the appropriate box			
General Device Data	Conforms to DeviceNet Specification	Volume I - Release *2.0*		Volume II - Release *2.0*	
		Errata 4, April 30, 2001			
	Vendor Name	*SEW Eurodrive GmbH*			
	Device Profile	*Vendor Specific*			
	Product Name	*SEW MOVIMOT MQD2x*			
	Product Code	*9*			
	Product Revision	*1.01*			
DeviceNet Physical Conformance Data	Network Power Consumption (Max)	*0,4 A @ 11V dc (worst case)*			
	Connector Style	Open-Hardwired	[ ]	Sealed-Mini	[ ]
		Open-Pluggable	[X]	Sealed-Micro	[ ]
	Isolated Physical Layer	Yes	[ ]		
		No	[ ]		
	LEDs Supported	Module	[ ]	Combo Mod/Net	[X]
	None [ ]	Network	[ ]	I/O	[ ]
	MAC ID Setting	DIP Switch	[X]	Software Settable	[ ]
		Other			
	Default MAC ID	*63*			
	Communication Rate Setting	DIP Switch	[X]	Software Settable	[ ]
		Other			
	Communication Rates Supported	125k bit/s	[X]	500k bit/s	[X]
		250k bit/s	[X]		
DeviceNet Communication Data	Device Network Behavior	Group 2 Client	[ ]	Group 2 Only Client	[ ]
	Check All That Apply	Group 2 Server	[ ]	Group 2 Only Server	[X]
		Peer-To-Peer	[ ]	Tool (not a Device)	[ ]
	UCMM Explicit Message Groups Supported	Group 1	[ ]	Group 2 [ ]	Group 3 [ ]
	Dynamic I/O Message Groups (Peer to Peer)	Group 1	[ ]	Group 2 [ ]	Group 3 [ ]
	Default I/O Data Address Path	Input: Class *4*		Inst. *64*	Attr. *3*
		Output: Class *4*		Inst. *64*	Attr. *3*
	Fragmented Explicit Messaging Supported	Yes	[ ]	No	[ ]
	If yes, Acknowledge TimeOut	*1000 ms*			
	Typical Target Addresses				
	Consumption Service *16*	Class *1*		Inst. *1*	Attr. *7*
	Production Service *14*	Class *1*		Inst. *1*	Attr. *7*

06214AXX

Device Net — Statement of Conformance

DeviceNet	Identity Object 0x01					
Required	**Object Class**	**ID**	**Description**	**Get**	**Set**	**Value Limits**
Object	Attributes Open	1	Revision	☐	☐	
Implementation		2	Max instance	☐	☐	
	☒ None Supported	3	Number of Instances	☐	☐	
		4	Optional attributes list	☐	☐	
		5	Optional services list	☐	☐	
		6	Max Id of class attributes	☐	☐	
		7	Max Id of instance attributes	☐	☐	
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attributes_All			
		☐	Reset			
	☒ None Supported	☐	Get_Attribute_Single			
		☐	Find_Next_Object_instance			
	Object Instance	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	Vendor	☒	☐	=(315)
		2	Device type	☒	☐	=(100)
		3	Product code	☒	☐	=(9)
		4	Revision	☒	☐	=(1.01)
		5	Status (bits supported)	☒	☐	
		6	Serial number	☒	☐	
		7	Product name	☒	☐	SEW MOVIMOT MQD2x
		8	State	☐	☐	
		9	Config. Consistency Value	☐	☐	
		10	Heartbeat Interval	☐	☐	
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attributes_All			
		☒	Reset	0		
		☒	Get_Attribute_Single			
		☐	Set_Attribute_Single			

Vendor Specific Additions Yes ☐ If yes, fill out the Vendor Specific Additions form. No ☒

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.

☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06215AXX

DeviceNet Statement of Conformance

Message Router Object 0x02

DeviceNet Required Object Implementation		ID	Description	Get	Set	Value Limits
	Object Class					
	Attributes Open	1	Revision	☐	☐	
		2	Max instance	☐	☐	
	☒ None Supported	3	Number of Instances	☐	☐	
		4	Optional attribute list	☐	☐	
		5	Optional service list	☐	☐	
		6	Max ID of class attributes	☐	☐	
		7	Max ID of instance attributes	☐	☐	

	DeviceNet Services	Parameter Options
Services	☐ Get_Attributes_All	
	☐ Get_Attribute_Single	
☒ None Supported		

Object Instance	ID	Description	Get	Set	Value Limits
Attributes Open	1	Object list	☐	☐	
	2	Maximum connections supporte	☐	☐	
☒ None Supported	3	Number of active connections	☐	☐	
	4	Active connections list	☐	☐	

	DeviceNet Services	Parameter Options
Services	☐ Get_Attributes_All	
	☐ Get_Attribute_Single	
☒ None Supported	☐ Set_Attribute_Single	

Vendor Specific Additions Yes ☐ If yes, fill out the Vendor Specific Additions form. No ☒

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.

☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06216AXX

DeviceNet Statement of Conformance

DeviceNet Required Object Implementation	DeviceNet Object 0x03					
	Object Class	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	Revision	X	☐	=(2)
		2	Max instance	☐	☐	
	☐ None Supported	3	Number of Instances	☐	☐	
		4	Optional attribute list	☐	☐	
		5	Optional service list	☐	☐	
		6	Max ID of class attributes	☐	☐	
		7	Max ID of instance attributes	☐	☐	
		DeviceNet Services		**Parameter Options**		
	Services	☐	Get_Attribute_Single			
	X None Supported					
	Object Instance	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	MAC ID	X	☐	=(0..63)
		2	Baud rate	X	☐	=(0..2)
	☐ None Supported	3	BOI	X	☐	=(0)
		4	Bus-off counter	X	X	=(0..255)
		5	Allocation information	X	☐	
		6	MAC ID switch changed	X	☐	=(0)
		7	Baud rate switch changed	X	☐	=(0)
		8	MAC ID switch value	X	☐	=(0..63)
		9	Baud rate switch value	X	☐	=(0..2)
		DeviceNet Services		**Parameter Options**		
	Services	X	Get_Attribute_Single			
		X	Set_Attribute_Single			
	☐ None Supported	X	Allocate M/S connection set			
		X	Release M/S connection set			

Vendor Specific Additions Yes ☐ If yes, fill out the Vendor Specific Additions form. No X

X **Get** indicates attribute value is returned by the Get_Attribute_Single service.

X **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06217AXX

DeviceNet Statement of Conformance

DeviceNet Required Object Implementation

Connection Object 0x05

Object Class

Attributes Open

[X] None Supported

Complete this sheet for each connection supported.

ID	Description	Get	Set	Value Limits
1	Revision	[ ]	[ ]	
2	Max instance	[ ]	[ ]	
3	Number of Instances	[ ]	[ ]	
4	Optional attribute list	[ ]	[ ]	
5	Optional service list	[ ]	[ ]	
6	Max ID of class attributes	[ ]	[ ]	
7	Max ID of instance attributes	[ ]	[ ]	

DeviceNet Services — **Parameter Options**

[X] None Supported

- [ ] Reset
- [ ] Create
- [ ] Delete
- [ ] Get_Attribute_Single
- [ ] Find_Next_Object_Instance

Object Instance

Connection Type	Max Connection Instances
M/S Explicit Message	1 Server, Client 1 Total

Complete this section for Dynamic I/O connections

Production trigger(s)	Cyclic	[ ]	COS	[ ]	App. trig.	[ ]
Transport type(s)	Server	[X]			Client	[ ]
Transport class(es)		[ ]	2	[X]	3	[ ]

Attributes Open

ID	Description	Get	Set	Value Limits
1	State	[X]	[ ]	
2	Instance type	[X]	[ ]	
3	Transport Class trigger	[X]	[ ]	
4	Produced connection ID	[X]	[ ]	
5	Consumed connection ID	[X]	[ ]	
6	Initial comm. characteristics	[X]	[ ]	
7	Produced connection size	[X]	[ ]	
8	Consumed connection size	[X]	[ ]	
9	Expected packet rate	[X]	[X]	=(0..65530)
12	Watchdog time-out action	[X]	[ ]	
13	Produced connection path len	[X]	[ ]	
14	Produced connection path	[X]	[ ]	
15	Consumed connection path len	[X]	[ ]	
16	Consumed connection path	[X]	[ ]	
17	Production inhibit time	[X]	[ ]	=(0)

DeviceNet Services — **Parameter Options**

Services

- [X] Reset
- [ ] Delete
- [ ] Apply_Attributes
- [X] Get_Attribute_Single
- [X] Set_Attribute_Single

Vendor Specific Additions Yes [ ] If yes, fill out the Vendor Specific Additions form. No [X]

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.

[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06218AXX

DeviceNet Statement of Conformance

DeviceNet Required Object Implementation

Connection Object 0x05

Object Class

Attributes Open

[X] None Supported

Complete this sheet for each connection supported.

ID	Description	Get	Set	Value Limits
1	Revision	[ ]	[ ]	
2	Max instance	[ ]	[ ]	
3	Number of Instances	[ ]	[ ]	
4	Optional attribute list	[ ]	[ ]	
5	Optional service list	[ ]	[ ]	
6	Max ID of class attributes	[ ]	[ ]	
7	Max ID of instance attributes	[ ]	[ ]	

DeviceNet Services — **Parameter Options**

[X] None Supported

- [ ] Reset
- [ ] Create
- [ ] Delete
- [ ] Get_Attribute_Single
- [ ] Find_Next_Object_Instance

Object Instance

Connection Type	Max Connection Instances
M/S Poll	1 Server, Client 1 Total

Complete this section for Dynamic I/O connections

Production trigger(s)	Cyclic	[ ]	COS	[ ]	App. trig.	[ ]
Transport type(s)	Server	[X]			Client	[ ]
Transport class(es)		[ ]	2	[X]	3	[ ]

Attributes Open

ID	Description	Get	Set	Value Limits
1	State	[X]	[ ]	
2	Instance type	[X]	[ ]	
3	Transport Class trigger	[X]	[ ]	
4	Produced connection ID	[X]	[ ]	
5	Consumed connection ID	[X]	[ ]	
6	Initial comm. characteristics	[X]	[ ]	
7	Produced connection size	[X]	[ ]	
8	Consumed connection size	[X]	[ ]	
9	Expected packet rate	[X]	[X]	=(0..65530)
12	Watchdog time-out action	[X]	[ ]	
13	Produced connection path len	[X]	[ ]	
14	Produced connection path	[X]	[ ]	
15	Consumed connection path len	[X]	[ ]	
16	Consumed connection path	[X]	[ ]	
17	Production inhibit time	[X]	[ ]	=(0)

DeviceNet Services — **Parameter Options**

Services

- [X] Reset
- [ ] Delete
- [ ] Apply_Attributes
- [X] Get_Attribute_Single
- [X] Set_Attribute_Single

Vendor Specific Additions Yes [ ] If yes, fill out the Vendor Specific Additions form. No [X]

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.

[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06219AXX

DeviceNet Statement of Conformance

Connection Object 0x05

DeviceNet Required Object Implementation

Object Class

Attributes Open

[X] None Supported

Complete this sheet for each connection supported.

ID	Description	Get	Set	Value Limits
1	Revision	[ ]	[ ]	
2	Max instance	[ ]	[ ]	
3	Number of Instances	[ ]	[ ]	
4	Optional attribute list	[ ]	[ ]	
5	Optional service list	[ ]	[ ]	
6	Max ID of class attributes	[ ]	[ ]	
7	Max ID of instance attributes	[ ]	[ ]	

DeviceNet Services	Parameter Options
[X] None Supported	
[ ] Reset	
[ ] Create	
[ ] Delete	
[ ] Get_Attribute_Single	
[ ] Find_Next_Object_Instance	

Object Instance

Connection Type	Max Connection Instances
M/S Bit Strobe	*1* Server Client *1* Total

Complete this section for Dynamic I/O connections

Production trigger(s)	Cyclic	[ ]	COS	[ ]	App. trig.	[ ]
Transport type(s)	Server	[X]			Client	[ ]
Transport class(es)		[ ]	2	[X]	3	[ ]

Attributes Open

ID	Description	Get	Set	Value Limits
1	State	[X]	[ ]	
2	Instance type	[X]	[ ]	
3	Transport Class trigger	[X]	[ ]	
4	Produced connection ID	[X]	[ ]	
5	Consumed connection ID	[X]	[ ]	
6	Initial comm. characteristics	[X]	[ ]	
7	Produced connection size	[X]	[ ]	
8	Consumed connection size	[X]	[ ]	
9	Expected packet rate	[X]	[X]	*=(0..65530)*
12	Watchdog time-out action	[X]	[ ]	
13	Produced connection path len	[X]	[ ]	
14	Produced connection path	[X]	[ ]	
15	Consumed connection path len	[X]	[ ]	
16	Consumed connection path	[X]	[ ]	
17	Production inhibit time	[X]	[ ]	*=(0)*

Services

DeviceNet Services	Parameter Options
[X] Reset	
[ ] Delete	
[ ] Apply_Attributes	
[X] Get_Attribute_Single	
[X] Set_Attribute_Single	

Vendor Specific Additions Yes [ ] If yes, fill out the Vendor Specific Additions form. No [X]

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.

[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06220AXX

DeviceNet Statement of Conformance

DeviceNet Required Object Implementation							
Register Object 0x07							
Object Class		**ID**	**Description**	**Get**	**Set**	**Value Limits**
Attributes Open		1	Revision	☐	☐	
		2	Max instance	☐	☐	
☒ None Supported		3	Number of Instances	☐	☐	
		4	Optional attribute list	☐	☐	
		5	Optional service list	☐	☐	
		6	Max ID of class attributes	☐	☐	
		7	Max ID of instance attributes	☐	☐	
	DeviceNet Services			**Parameter Options**		
Services	☐	Get_Attribute_Single				
☒ None Supported						
Object Instance		**ID**	**Description**	**Get**	**Set**	**Value Limits**
Attributes Open		1	Bad Flag	☒	☐	
		2	Direction	☒	☐	
☐ None Supported		3	Size	☒	☐	
		4	Data	☒	☒	
	DeviceNet Services			**Parameter Options**		
Services	☒	Get_Attribute_Single		*84520000000000*		
☐ None Supported	☒	Set_Attribute_Single				

Vendor Specific Additions Yes ☐ If yes, fill out the Vendor Specific Additions form. No ☒

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.

☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06221AXX

DeviceNet Statement of Conformance

Parameter Object 0x0F

DeviceNet Required Object Implementation

Object Class

Attributes Open

☐ None Supported

ID	Description	Get	Set	Value Limits
1	Revision	☐	☐	
2	Max instance	X	☐	
3	Number of Instances	☐	☐	
4	Optional attribute list	☐	☐	
5	Optional service list	☐	☐	
6	Max ID of class attributes	☐	☐	
7	Max ID of instance attributes	☐	☐	
8	Parameter class descriptor	X	☐	
9	Configuration assembly instanc	X	☐	
10	Native language	☐	☐	

DeviceNet Services — **Parameter Options**

Services

☐ None Supported

☐	Get_Attributes_All		
☐	Reset		
X	Get_Attribute_Single		
☐	Set_Attribute_Single		
☐	Restore	☐	Save

Object Instance

Attributes Open

☐ None Supported

ID	Description	Get	Set	Value Limits
1	Parameter value	X	X	
2	Link Path size	X	☐	
3	Link path	X	☐	
4	Descriptor	X	☐	
5	Data type	X	☐	
6	Data size	X	☐	
7	Parameter name string	☐	☐	
8	Units string	☐	☐	
9	Help string	☐	☐	
10	Minimum value	☐	☐	
11	Maximum value	☐	☐	
12	Default value	☐	☐	
13	Scaling multiplier	☐	☐	
14	Scaling divisor	☐	☐	
15	Scaling base	☐	☐	
16	Scaling offset	☐	☐	
17	Multiplier link	☐	☐	
18	Divisor link	☐	☐	
19	Base link	☐	☐	
20	Offset link	☐	☐	
21	Decimal precision	☐	☐	

DeviceNet Services

Services

☐ None Supported

☐	Get_Attribute_All		
X	Get_Attribute_Single	X	Set_Attribute_Single

Vendor Specific Additions Yes ☐ If yes, fill out the Vendor Specific Additions form. No X

X **Get** indicates attribute value is returned by the Get_Attribute_Single service.

X **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06222AXX

18.8 Statement of Conformance for MQD3X DeviceNet Interface

DeviceNet — Statement of Conformance

SOC data as of 2 - 14 - 2003

		Fill in the blank or [X] the appropriate box			
General Device Data	Conforms to DeviceNet Specification	Volume I - Release *2.0*		Volume II - Release *2.0*	
		Errata 4, April 30, 2001			
	Vendor Name	*SEW Eurodrive GmbH*			
	Device Profile	*Vendor Specific*			
	Product Name	*SEW MOVIMOT MQD3x*			
	Product Code	*8*			
	Product Revision	*1.01*			
DeviceNet Physical Conformance Data	Network Power Consumption (Max)	*0,4 A @ 11V dc (worst case)*			
	Connector Style	Open-Hardwired	[ ]	Sealed-Mini	[ ]
		Open-Pluggable	[X]	Sealed-Micro	[ ]
	Isolated Physical Layer	Yes	[ ]		
		No	[ ]		
	LEDs Supported	Module	[ ]	Combo Mod/Net	[X]
	None [ ]	Network	[ ]	I/O	[ ]
	MAC ID Setting	DIP Switch	[X]	Software Settable	[ ]
		Other			
	Default MAC ID	*63*			
	Communication Rate Setting	DIP Switch	[X]	Software Settable	[ ]
		Other			
	Communication Rates Supported	125k bit/s	[X]	500k bit/s	[X]
		250k bit/s	[X]		
DeviceNet Communication Data	Device Network Behavior	Group 2 Client	[ ]	Group 2 Only Client	[ ]
	Check All That Apply	Group 2 Server	[ ]	Group 2 Only Server	[X]
		Peer-To-Peer	[ ]	Tool (not a Device)	[ ]
	UCMM Explicit Message Groups Supported	Group 1	[ ]	Group 2 [ ]	Group 3 [ ]
	Dynamic I/O Message Groups (Peer to Peer)	Group 1	[ ]	Group 2 [ ]	Group 3 [ ]
	Default I/O Data Address Path	Input: Class *4*		Inst. *64*	Attr. *3*
		Output: Class *4*		Inst. *64*	Attr. *3*
	Fragmented Explicit Messaging Supported	Yes	[ ]	No	[ ]
	If yes, Acknowledge TimeOut	*1000 ms*			
	Typical Target Addresses				
	Consumption Service *16*	Class *1*		Inst. *1*	Attr. *7*
	Production Service *14*	Class *1*		Inst. *1*	Attr. *7*

06205AXX

DeviceNet Statement of Conformance

Identity Object 0x01

DeviceNet Required Object Implementation	Object Class	ID	Description	Get	Set	Value Limits
	Attributes Open	1	Revision	☐	☐	
		2	Max instance	☐	☐	
	☒ None Supported	3	Number of Instances	☐	☐	
		4	Optional attributes list	☐	☐	
		5	Optional services list	☐	☐	
		6	Max Id of class attributes	☐	☐	
		7	Max Id of instance attributes	☐	☐	

	DeviceNet Services		Parameter Options
Services	☐	Get_Attributes_All	
	☐	Reset	
☒ None Supported	☐	Get_Attribute_Single	
	☐	Find_Next_Object_instance	

Object Instance	ID	Description	Get	Set	Value Limits
Attributes Open	1	Vendor	☒	☐	=(315)
	2	Device type	☒	☐	=(100)
	3	Product code	☒	☐	=(8)
	4	Revision	☒	☐	=(1.01)
	5	Status (bits supported)	☒	☐	
	6	Serial number	☒	☐	
	7	Product name	☒	☐	SEW MOVIMOT MQD3x
	8	State	☐	☐	
	9	Config. Consistency Value	☐	☐	
	10	Heartbeat Interval	☐	☐	

	DeviceNet Services		Parameter Options
Services	☐	Get_Attributes_All	
	☒	Reset	0
	☒	Get_Attribute_Single	
	☐	Set_Attribute_Single	

Vendor Specific Additions Yes ☐ If yes, fill out the Vendor Specific Additions form. No ☒

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.

☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

6206AXX

DeviceNet Statement of Conformance

DeviceNet	Message Router Object 0x02					
Required	Object Class	ID	Description	Get	Set	Value Limits
Object Implementation	Attributes Open	1	Revision	☐	☐	
		2	Max instance	☐	☐	
	[X] None Supported	3	Number of Instances	☐	☐	
		4	Optional attribute list	☐	☐	
		5	Optional service list	☐	☐	
		6	Max ID of class attributes	☐	☐	
		7	Max ID of instance attributes	☐	☐	
		DeviceNet Services		Parameter Options		
	Services	☐	Get_Attributes_All			
		☐	Get_Attribute_Single			
	[X] None Supported					
	Object Instance	ID	Description	Get	Set	Value Limits
	Attributes Open	1	Object list	☐	☐	
		2	Maximum connections supporte	☐	☐	
	[X] None Supported	3	Number of active connections	☐	☐	
		4	Active connections list	☐	☐	
		DeviceNet Services		Parameter Options		
	Services	☐	Get_Attributes_All			
		☐	Get_Attribute_Single			
	[X] None Supported	☐	Set_Attribute_Single			

Vendor Specific Additions Yes ☐ If yes, fill out the Vendor Specific Additions form. No [X]

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.

[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06207AXX

DeviceNet Statement of Conformance

DeviceNet Required Object Implementation	DeviceNet Object 0x03					
	Object Class	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	Revision	X		=(2)
		2	Max instance			
	☐ None Supported	3	Number of Instances			
		4	Optional attribute list			
		5	Optional service list			
		6	Max ID of class attributes			
		7	Max ID of instance attributes			
		DeviceNet Services				**Parameter Options**
	Services	☐	Get_Attribute_Single			
	☒ None Supported					
	Object Instance	**ID**	**Description**	**Get**	**Set**	**Value Limits**
	Attributes Open	1	MAC ID	X		=(0..63)
		2	Baud rate	X		=(0..2)
	☐ None Supported	3	BOI	X		=(0)
		4	Bus-off counter	X	X	=(0..255)
		5	Allocation information	X		
		6	MAC ID switch changed	X		=(0)
		7	Baud rate switch changed	X		=(0)
		8	MAC ID switch value	X		=(0..63)
		9	Baud rate switch value	X		=(0..2)
		DeviceNet Services				**Parameter Options**
	Services	☒	Get_Attribute_Single			
		☒	Set_Attribute_Single			
	☐ None Supported	☒	Allocate M/S connection set			
		☒	Release M/S connection set			

Vendor Specific Additions Yes ☐ If yes, fill out the Vendor Specific Additions form. No ☒

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.

☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06208AXX

DeviceNet Statement of Conformance

DeviceNet Required Object Implementation

Connection Object 0x05

Object Class

Attributes Open

[X] None Supported

Complete this sheet for each connection supported.

ID	Description	Get	Set	Value Limits
1	Revision	[ ]	[ ]	
2	Max instance	[ ]	[ ]	
3	Number of Instances	[ ]	[ ]	
4	Optional attribute list	[ ]	[ ]	
5	Optional service list	[ ]	[ ]	
6	Max ID of class attributes	[ ]	[ ]	
7	Max ID of instance attributes	[ ]	[ ]	

DeviceNet Services — **Parameter Options**

[X] None Supported

- [ ] Reset
- [ ] Create
- [ ] Delete
- [ ] Get_Attribute_Single
- [ ] Find_Next_Object_Instance

Object Instance

Connection Type	Max Connection Instances
M/S Explicit Message	1 Server Client 1 Total

Complete this section for Dynamic I/O connections

Production trigger(s)	Cyclic	[ ]	COS [ ]	App. trig.	[ ]
Transport type(s)	Server	[X]		Client	[ ]
Transport class(es)		[ ]	2 [X]	3	[ ]

Attributes Open

ID	Description	Get	Set	Value Limits
1	State	[X]	[ ]	
2	Instance type	[X]	[ ]	
3	Transport Class trigger	[X]	[ ]	
4	Produced connection ID	[X]	[ ]	
5	Consumed connection ID	[X]	[ ]	
6	Initial comm. characteristics	[X]	[ ]	
7	Produced connection size	[X]	[ ]	
8	Consumed connection size	[X]	[ ]	
9	Expected packet rate	[X]	[X]	=(0..65530)
12	Watchdog time-out action	[X]	[ ]	
13	Produced connection path len	[X]	[ ]	
14	Produced connection path	[X]	[ ]	
15	Consumed connection path len	[X]	[ ]	
16	Consumed connection path	[X]	[ ]	
17	Production inhibit time	[X]	[ ]	=(0)

DeviceNet Services — **Parameter Options**

Services

- [X] Reset
- [ ] Delete
- [ ] Apply_Attributes
- [X] Get_Attribute_Single
- [X] Set_Attribute_Single

Vendor Specific Additions Yes [ ] If yes, fill out the Vendor Specific Additions form. No [X]

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.

[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06209AXX

DeviceNet Statement of Conformance

DeviceNet Required Object Implementation

Connection Object 0x05

Object Class

Attributes Open

[X] None Supported

Complete this sheet for each connection supported.

ID	Description	Get	Set	Value Limits
1	Revision	[ ]	[ ]	
2	Max instance	[ ]	[ ]	
3	Number of Instances	[ ]	[ ]	
4	Optional attribute list	[ ]	[ ]	
5	Optional service list	[ ]	[ ]	
6	Max ID of class attributes	[ ]	[ ]	
7	Max ID of instance attributes	[ ]	[ ]	

DeviceNet Services	Parameter Options
[X] None Supported	
[ ] Reset	
[ ] Create	
[ ] Delete	
[ ] Get_Attribute_Single	
[ ] Find_Next_Object_Instance	

Object Instance

Connection Type	Max Connection Instances
M/S Poll	1 Server Client 1 Total

Complete this section for Dynamic I/O connections

Production trigger(s)	Cyclic	[ ]	COS	[ ]	App. trig.	[ ]
Transport type(s)	Server	[X]			Client	[ ]
Transport class(es)		[ ]	2	[X]	3	[ ]

Attributes Open

ID	Description	Get	Set	Value Limits
1	State	[X]	[ ]	
2	Instance type	[X]	[ ]	
3	Transport Class trigger	[X]	[ ]	
4	Produced connection ID	[X]	[ ]	
5	Consumed connection ID	[X]	[ ]	
6	Initial comm. characteristics	[X]	[ ]	
7	Produced connection size	[X]	[ ]	
8	Consumed connection size	[X]	[ ]	
9	Expected packet rate	[X]	[X]	=(0..65530)
12	Watchdog time-out action	[X]	[ ]	
13	Produced connection path len	[X]	[ ]	
14	Produced connection path	[X]	[ ]	
15	Consumed connection path len	[X]	[ ]	
16	Consumed connection path	[X]	[ ]	
17	Production inhibit time	[X]	[ ]	=(0)

Services

DeviceNet Services	Parameter Options
[X] Reset	
[ ] Delete	
[ ] Apply_Attributes	
[X] Get_Attribute_Single	
[X] Set_Attribute_Single	

Vendor Specific Additions Yes [ ] If yes, fill out the Vendor Specific Additions form. No [X]

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.

[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06210AXX

DeviceNet Statement of Conformance

DeviceNet Required Object Implementation

Connection Object 0x05

Object Class

Attributes Open

[X] None Supported

Complete this sheet for each connection supported.

ID	Description	Get	Set	Value Limits
1	Revision	[ ]	[ ]	
2	Max instance	[ ]	[ ]	
3	Number of Instances	[ ]	[ ]	
4	Optional attribute list	[ ]	[ ]	
5	Optional service list	[ ]	[ ]	
6	Max ID of class attributes	[ ]	[ ]	
7	Max ID of instance attributes	[ ]	[ ]	

DeviceNet Services	Parameter Options
[X] None Supported	
[ ] Reset	
[ ] Create	
[ ] Delete	
[ ] Get_Attribute_Single	
[ ] Find_Next_Object_Instance	

Object Instance

Connection Type	Max Connection Instances
M/S Bit Strobe	1 Server Client 1 Total

Complete this section for Dynamic I/O connections

Production trigger(s)	Cyclic	[ ]	COS	[ ]	App. trig.	[ ]
Transport type(s)	Server	[X]			Client	[ ]
Transport class(es)		[ ]	2	[X]	3	[ ]

Attributes Open

ID	Description	Get	Set	Value Limits
1	State	[X]	[ ]	
2	Instance type	[X]	[ ]	
3	Transport Class trigger	[X]	[ ]	
4	Produced connection ID	[X]	[ ]	
5	Consumed connection ID	[X]	[ ]	
6	Initial comm. characteristics	[X]	[ ]	
7	Produced connection size	[X]	[ ]	
8	Consumed connection size	[X]	[ ]	
9	Expected packet rate	[X]	[X]	=(0..65530)
12	Watchdog time-out action	[X]	[ ]	
13	Produced connection path len	[X]	[ ]	
14	Produced connection path	[X]	[ ]	
15	Consumed connection path len	[X]	[ ]	
16	Consumed connection path	[X]	[ ]	
17	Production inhibit time	[X]	[ ]	=(0)

Services

DeviceNet Services	Parameter Options
[X] Reset	
[ ] Delete	
[ ] Apply_Attributes	
[X] Get_Attribute_Single	
[X] Set_Attribute_Single	

Vendor Specific Additions Yes [ ] If yes, fill out the Vendor Specific Additions form. No [X]

[X] **Get** indicates attribute value is returned by the Get_Attribute_Single service.

[X] **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06211AXX

DeviceNet Statement of Conformance

Register Object 0x07

DeviceNet Required Object Implementation	Object Class	ID	Description	Get	Set	Value Limits
	Attributes Open	1	Revision	☐	☐	
		2	Max instance	☐	☐	
	☒ None Supported	3	Number of Instances	☐	☐	
		4	Optional attribute list	☐	☐	
		5	Optional service list	☐	☐	
		6	Max ID of class attributes	☐	☐	
		7	Max ID of instance attributes	☐	☐	

	DeviceNet Services		Parameter Options
Services	☐	Get_Attribute_Single	
☒ None Supported			

Object Instance	ID	Description	Get	Set	Value Limits
Attributes Open	1	Bad Flag	☒	☐	
	2	Direction	☒	☐	
☐ None Supported	3	Size	☒	☐	
	4	Data	☒	☒	

	DeviceNet Services		Parameter Options
Services	☒	Get_Attribute_Single	*84520000000000*
☐ None Supported	☒	Set_Attribute_Single	

Vendor Specific Additions Yes ☐ If yes, fill out the Vendor Specific Additions form. No ☒

☒ **Get** indicates attribute value is returned by the Get_Attribute_Single service.

☒ **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06212AXX

DeviceNet Statement of Conformance

Parameter Object 0x0F

DeviceNet Required Object Implementation

Object Class

Attributes Open

☐ None Supported

ID	Description	Get	Set	Value Limits
1	Revision	☐	☐	
2	Max instance	X	☐	
3	Number of Instances	☐	☐	
4	Optional attribute list	☐	☐	
5	Optional service list	☐	☐	
6	Max ID of class attributes	☐	☐	
7	Max ID of instance attributes	☐	☐	
8	Parameter class descriptor	X	☐	
9	Configuration assembly instanc	X	☐	
10	Native language	☐	☐	

DeviceNet Services — **Parameter Options**

Services

☐ None Supported

☐	Get_Attributes_All	
☐	Reset	
X	Get_Attribute_Single	
☐	Set_Attribute_Single	
☐	Restore	☐ Save

Object Instance

Attributes Open

☐ None Supported

ID	Description	Get	Set	Value Limits
1	Parameter value	X	X	*=(0..4294967294)*
2	Link Path size	X	☐	
3	Link path	X	☐	
4	Descriptor	X	☐	
5	Data type	X	☐	
6	Data size	X	☐	*=(4)*
7	Parameter name string	☐	☐	
8	Units string	☐	☐	
9	Help string	☐	☐	
10	Minimum value	☐	☐	
11	Maximum value	☐	☐	
12	Default value	☐	☐	
13	Scaling multiplier	☐	☐	
14	Scaling divisor	☐	☐	
15	Scaling base	☐	☐	
16	Scaling offset	☐	☐	
17	Multiplier link	☐	☐	
18	Divisor link	☐	☐	
19	Base link	☐	☐	
20	Offset link	☐	☐	
21	Decimal precision	☐	☐	

DeviceNet Services

Services

☐ None Supported

☐	Get_Attribute_All		
X	Get_Attribute_Single	X	Set_Attribute_Single

Vendor Specific Additions Yes ☐ If yes, fill out the Vendor Specific Additions form. No X

X **Get** indicates attribute value is returned by the Get_Attribute_Single service.

X **Set** indicates attribute value is written to by the Set_Attribute_Single service.

06213AXX

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Address List

Germany			
Headquarters **Production** **Sales** **Service**	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 · D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de Service Electronics: Tel. +49 171 7210791 Service Gear Units and Motors: Tel. +49 172 7601377
Assembly **Service**	**Garbsen** (near Hannover)	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen P.O. Box Postfach 110453 · D-30804 Garbsen	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 scm-garbsen@sew-eurodrive.de
	Kirchheim (near München)	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim	Tel. +49 89 909552-10 Fax +49 89 909552-50 scm-kirchheim@sew-eurodrive.de
	Langenfeld (near Düsseldorf)	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 scm-langenfeld@sew-eurodrive.de
	Meerane (near Zwickau)	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 scm-meerane@sew-eurodrive.de
	Additional addresses for service in Germany provided on request!		

France			
Production **Sales** **Service**	**Haguenau**	SEW-USOCOME 48-54, route de Soufflenheim B. P. 185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocome.com sew@usocome.com
Assembly **Sales** **Service**	**Bordeaux**	SEW-USOCOME Parc d'activités de Magellan 62, avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Paris	SEW-USOCOME Zone industrielle 2, rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
	Additional addresses for service in France provided on request!		

Algeria			
Sales	**Alger**	Réducom 16, rue des Frères Zaghnoun Bellevue El-Harrach 16200 Alger	Tel. +213 21 8222-84 Fax +213 21 8222-84

Argentina			
Assembly **Sales** **Service**	**Buenos Aires**	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 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			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://sew-eurodrive.at sew@sew-eurodrive.at

Belgium			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be

Brazil			
Production **Sales** **Service**	**Sao Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 50 Caixa Postal: 201-07111-970 Guarulhos/SP - Cep.: 07251-250	Tel. +55 11 6489-9133 Fax +55 11 6480-3328 http://www.sew.com.br sew@sew.com.br
	Additional addresses for service in Brazil provided on request!		

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GMBH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 (2) 9532565 Fax +359 (2) 9549345 bever@mbox.infotel.bg

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 4322-99 Fax +237 4277-03

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, Ontario L6T3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.reynolds@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street Delta. B.C. V4G 1 E2	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Street LaSalle, Quebec H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
	Additional addresses for service in Canada provided on request!		

Chile			
Assembly **Sales** **Service**	**Santiago de Chile**	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 sewsales@entelchile.net

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25322611 http://www.sew.com.cn
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021 P. R. China	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew.com.cn

Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 sewcol@andinet.com

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@net.hr

Czech Republic			
Sales	**Praha**	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Luná 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 220121234 + 220121236 Fax +420 220121237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Kopenhagen**	SEW-EURODRIVEA/S Geminivej 28-30, P.O. Box 100 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Paldiski mnt.125 EE 0006 Tallin	Tel. +372 6593230 Fax +372 6593231

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 3 589-300 Fax +358 3 7806-211 http://www.sew-eurodrive.fi sew@sew-eurodrive.fi

Gabon			
Sales	**Libreville**	Electro-Services B.P. 1889 Libreville	Tel. +241 7340-11 Fax +241 7340-12

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West- Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk

Greece			
Sales **Service**	**Athen**	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr Boznos@otenet.gr

Hong Kong			
Assembly **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 2 7960477 + 79604654 Fax +852 2 7959129 sew@sewhk.com

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 sew-eurodrive.voros@matarnet.hu

India			
Assembly **Sales** **Service**	**Baroda**	SEW-EURODRIVE India Pvt. Ltd. Plot No. 4, Gidc Por Ramangamdi · Baroda - 391 243 Gujarat	Tel. +91 265 2831021 Fax +91 265 2831087 sew.baroda@gecsl.com
Technical Offices	**Bangalore**	SEW-EURODRIVE India Private Limited 308, Prestige Centre Point 7, Edward Road Bangalore	Tel. +91 80 22266565 Fax +91 80 22266569 sewbangalore@sify.com
	Mumbai	SEW-EURODRIVE India Private Limited 312 A, 3rd Floor, Acme Plaza Andheri Kurla Road, Andheri (E) Mumbai	Tel. +91 22 28348440 Fax +91 22 28217858 sewmumbai@vsnl.net

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

Italy			
Assembly **Sales** **Service**	**Milano**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 2 96 9801 Fax +39 2 96 799781 sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 2579-44 Fax +225 2584-36

Japan			
Assembly **Sales** **Service**	**Toyoda-cho**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Toyoda-cho, Iwata gun Shizuoka prefecture, 438-0818	Tel. +81 538 373811 Fax +81 538 373814 sewjapan@sew-eurodrive.co.jp

Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate Unit 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 master@sew-korea.co.kr

Lebanon			
Sales	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 4947-86 +961 1 4982-72 +961 3 2745-39 Fax +961 1 4949-71 gacar@beirut.com

Luxembourg			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be

Macedonia			
Sales	**Skopje**	SGS-Skopje / Macedonia "Teodosij Sinactaski" 66 91000 Skopje / Macedonia	Tel. +389 2 385 466 Fax +389 2 384 390 sgs@mol.com.mk

Malaysia			
Assembly **Sales** **Service**	**Johore**	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 kchtan@pd.jaring.my

Morocco			
Sales	**Casablanca**	S. R. M. Société de Réalisations Mécaniques 5, rue Emir Abdelkader 05 Casablanca	Tel. +212 2 6186-69 + 6186-70 + 6186-71 Fax +212 2 6215-88 srm@marocnet.net.ma

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu

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 sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 385-6455 sales@sew-eurodrive.co.nz

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 241-020 Fax +47 69 241-040 sew@sew-eurodrive.no

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos # 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 sewperu@terra.com.pe

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Lodz	Tel. +48 42 67710-90 Fax +48 42 67710-99 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucuresti**	Sialco Trading SRL str. Madrid nr.4 71222 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Sales	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 263 RUS-195220 St. Petersburg	Tel. +7 812 5357142 +812 5350430 Fax +7 812 5352287 sew@sew-eurodrive.ru

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 849 47-70 Fax +221 849 47-71 senemeca@sentoo.sn

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 ... 1705 Fax +65 68612827 Telex 38 659 sales@sew-eurodrive.com.sg

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO – 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 Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-2311 ljansen@sew.co.za
	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 dswanepoel@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 9 4431 84-70 Fax +34 9 4431 84-71 sew.spain@sew-eurodrive.es

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442-00 Fax +46 36 3442-80 http://www.sew-eurodrive.se info@sew-eurodrive.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 41717-17 Fax +41 61 41717-00 http://www.imhof-sew.ch info@imhof-sew.ch

Thailand			
Assembly **Sales** **Service**	**Chon Buri**	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.co.th

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service 7, rue Ibn EI Heithem Z.I. SMMT 2014 Mégrine Erriadh	Tel. +216 1 4340-64 + 1 4320-29 Fax +216 1 4329-76

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri Sirketi Bagdat Cad. Koruma Cikmazi No. 3 TR-81540 Maltepe ISTANBUL	Tel. +90 216 4419163 + 216 4419164 + 216 3838014 Fax +90 216 3055867 sew@sew-eurodrive.com.tr

USA			
Production **Assembly** **Sales** **Service**	**Greenville**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manuf. +1 864 439-9948 Fax Ass. +1 864 439-0566 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**San Francisco**	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 467-3792 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 sewventas@cantv.net sewfinanzas@cantv.net

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