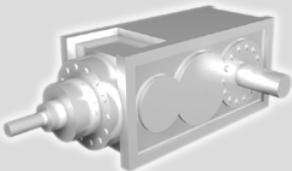
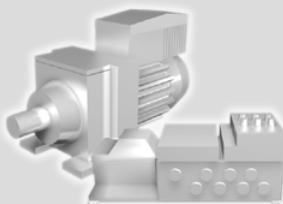
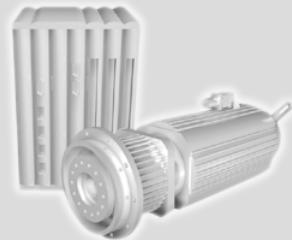
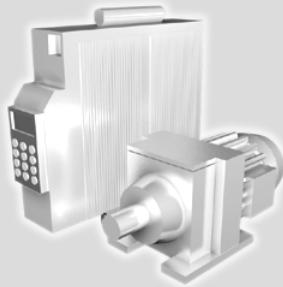




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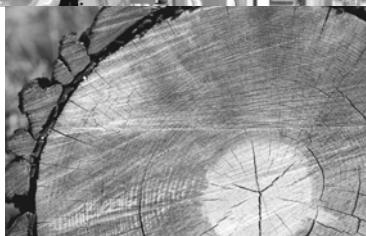


## **MOVI-PLC® I/O System**

Edition 07/2007

11617012 / EN

**Manual**



**SEW**  
**EURODRIVE**



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## 1 General Information

### 1.1 Structure of the safety notes

The safety notes in this manual are designed as follows:

Pictogram	<b>! SIGNAL WORD!</b>
	<p>Type and source of danger.</p> <p>Possible consequence(s) if the safety notes are disregarded.</p> <ul style="list-style-type: none"> <li>Measure(s) to prevent the danger.</li> </ul>

Pictogram	Signal word	Meaning	Consequences in case of disregard
Example:  General danger   Specific danger, e.g. electric shock	! DANGER!	Imminent danger	Severe or fatal injuries
	! WARNING!	Possible dangerous situation	Severe or fatal injuries
	! CAUTION!	Possible dangerous situation	Minor injuries
	STOP!	Possible damage to property	Damage to the drive system or its environment
	NOTE	Useful information or a tip Simplifies the handling of the drive system	

### 1.2 Rights to claim under limited warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the MOVI-PLC® documentation. Therefore, read the manual before you start operating the unit.

Make sure that the manual is available to persons responsible for the plant and its operation, as well as to person who work independently on the unit. You must also ensure that the documentation is legible.

### 1.3 Exclusion of liability

You must comply with the information contained in the MOVI-PLC® documentation to ensure safe operation of the MOVI-PLC® controller and to achieve the specified product characteristics and performance requirements. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.



#### 1.4 Other applicable documentation

- Installation and startup only by trained personnel observing the relevant accident prevention regulations and the following documents:
  - "MOVIDRIVE® MDX60B/61B" operating instructions
  - "MOVITRAC® B" operating instructions
  - "MOVIAXIS® MX Multi-Axis Servo Inverter" operating instructions
  - "MOVI-PLC® basic DHP11B Controller" manual
  - "MOVI-PLC® advanced DH.41B" manual
  - "Libraries for MOVI-PLC® – Fault Codes" manual
  - "MPLCUtilities Libraries for MOVI-PLC®" manual
  - "MOVI-PLC® programming in the PLC Editor" system manual
- Read through these documents carefully before you commence installation and startup of the MOVI-PLC® I/O system.
- As a prerequisite to fault-free operation and fulfillment of warranty claims, you must adhere to the information in the documentation.

#### 1.5 General safety notes for bus systems

You are now in possession of a communication system that lets you adapt MOVI-PLC® controllers, MOVI-PLC® I/O systems and the controlled inverters to your specific system. As with all bus systems, there is a danger of invisible, external (as far as the inverter is concerned) modifications to the parameters which give rise to changes in the unit behavior. This may result in unexpected (not uncontrolled) system behavior.

#### 1.6 Safety functions

MOVI-PLC® and the MOVI-PLC® I/O system may not perform safety functions.

For safety applications, refer to the information in the following publications.

- Safe disconnection for MOVIDRIVE® / MOVIAXIS® / MOVITRAC® B

Use only those components in safety applications that were explicitly delivered in this design by SEW-EURODRIVE!

#### 1.7 Hoist applications

- Hoist applications can only be implemented with MOVI-PLC® under the following conditions:
  - A special hoist startup of the inverters must be performed.
- Do not use MOVI-PLC® and the MOVI-PLC® I/O system for any safety functions in conjunction with hoist applications.

Use monitoring systems or mechanical protection devices as safety equipment to avoid possible damage to property or injury to people.

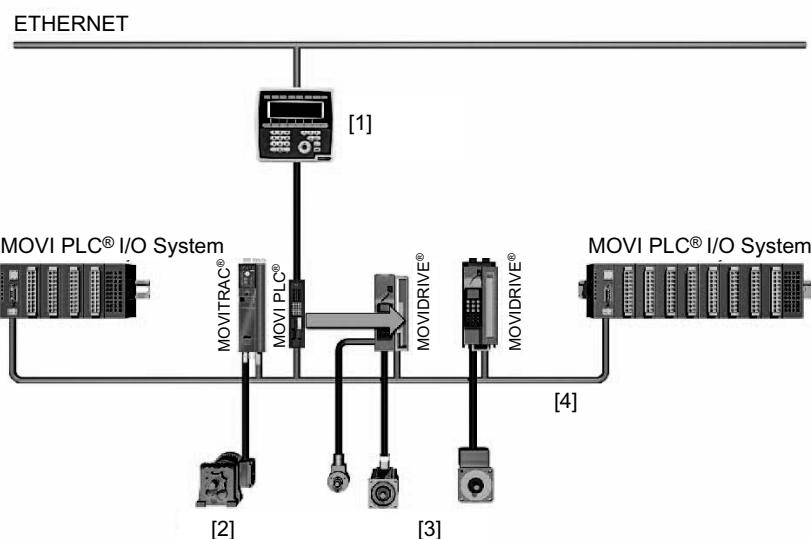


## 2 System Description

### 2.1 MOVI-PLC® I/O system

The modular MOVI-PLC® I/O system expands the digital and analog interfaces of the MOVI-PLC® controller. A MOVI-PLC® I/O system contains a bus coupler to which up to 32 I/O modules can be connected via backplane bus. The bus coupler communicates with the MOVI-PLC® via system bus. Up to 126 bus couplers and consequently MOVI-PLC® I/O systems can be connected to a MOVI-PLC® controller. This means the MOVI-PLC® controller can automatically access a large number of inputs and outputs.

- MOVI-PLC® I/O systems
- Inputs and outputs directly integrated in the MOVI-PLC® controller
- Inputs and outputs of the controlled inverters



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- [1] Operator terminal (e.g. DOP11A)
- [2] Asynchronous motor
- [3] Servomotors
- [4] System bus (connect MOVI-PLC® I/O systems and inverters separately to CAN1 and CAN2 of the MOVI-PLC® controller)



**Advantages of  
the MOVI-PLC®  
I/O system**

- Powerful connection to the MOVI-PLC® controller via the SBus of the machine module.
- Optimum integration into the programming software PLC Editor of the MOVITOOLS® MotionStudio.
- A variety of combination options allows for implementing flexible and individual machine solutions.
- The compact design and the modular structure reduce control cabinet space requirements to a minimum.
- Quick and easy installation or replacement in case of startup or service

## 2.2 Scope of delivery of the individual components

**OCC11B bus  
coupler**

Bus coupler backplane bus – CAN.

Type	Part number
OCC11B	1821 479 7

**ODI81B digital  
input module**

I/O module with 8 binary inputs.

Type	Part number
ODI81B	1821 481 9

**ODO81B digital  
output module**

I/O module with 8 binary outputs.

Type	Part number
ODO81B	1821 482 7

**OAI41B analog  
input module**

I/O module (voltage) with 4 analog inputs.

Type	Part number
OAI41B	1821 483 5

**OAI42B analog  
input module**

I/O module (current) with 4 analog inputs.

Type	Part number
OAI42B	1821 484 3

**OAI43B analog  
input module**

I/O module (multi input) with 4 analog inputs.

Type	Part number
OAI43B	1821 485 1

**OAO41B analog  
output module**

I/O module (voltage) with 4 analog outputs.

Type	Part number
OAO41B	1821 487 8

**OAO42B analog  
output module**

I/O module (current) with 4 analog outputs.

Type	Part number
OAO42B	1821 488 6



**OAO43B analog output module** I/O module (multi output) with 4 analog outputs.

Type	Part number
OAO43B	1821 489 4

**Terminal module OTM21B** Terminal module for 2 or 3-wire installation

Type	Part number
OTM21B	1821 490 8

### 2.3 Accessories

**Connection cable OKC11B** Connection cable between MOVI-PLC® (X32 or X33 connection) and bus coupler OCC11B.

Type	Part number
OKC11B	1810 482 7

**Backplane bus connector OBP..B** Each I/O module and each terminal module is supplied with a single-socket backplane bus connector. 10 x single-socket backplane bus connectors are supplied for reorders.

Type	Part number
OBP11B ( 10 x single backplane bus connector)	1821 491 6
OBP81B ( 1 x 8-socket backplane bus connector)	1821 492 4



#### NOTES

- When connecting I/O modules to one bus coupler, replace 8 single-socket backplane connectors by one 8-socket backplane connector OBP81B each (i.e. 16 I/O modules → 2 × 8-socket backplane bus connectors, etc.).
- The 8-socket backplane connectors OBP81B have to be ordered separately.

**UWU52A switched-mode power supply**

You can use the UWU52A switched-mode power supply for DC 24 V voltage supply of the MOVI-PLC I/O system.

Type	Part number
UWU52A	188 181 7



#### NOTES

- For installation notes and technical data of the UWU52A switched-mode power supply unit, refer to the "Appendix" section.
- Observe the maximum rated output currents and the operating temperature.



## 3 Installation

### 3.1 Mechanical installation

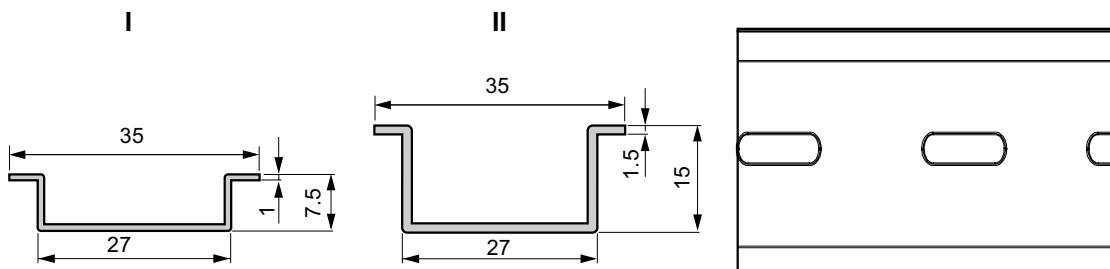
**Notes on installing the modules of the MOVI-PLC® I/O system**

	<b>STOP!</b> Observe the following points to prevent the I/O module from being damaged: Switch off the voltage supply before you install or remove a module.
--	--

	<b>NOTES</b> <ul style="list-style-type: none"> <li>The individual modules are installed on a mounting rail. They are connected using backplane bus connectors. The bus connector is placed into the profile rail that carries the modules.</li> <li>The modules must always be installed directly next to each other. Gaps between the modules are not permitted, else the backplane bus is interrupted.</li> <li>A row of modules is always installed from left to right and always begins with a bus coupler.</li> <li>A module is not properly installed and electrically connected until it audibly locks in place in the backplane connector.</li> <li>Plug-in locations to the right of the last module must not remain free.</li> </ul>
--	---

**Dimension drawing for mounting rail**

You can use the following 35 mm standard profile rail (→ following figure) for installation. SEW-EURODRIVE recommends to use version II to ensure sufficient space for the retaining screws under the backplane bus connector.



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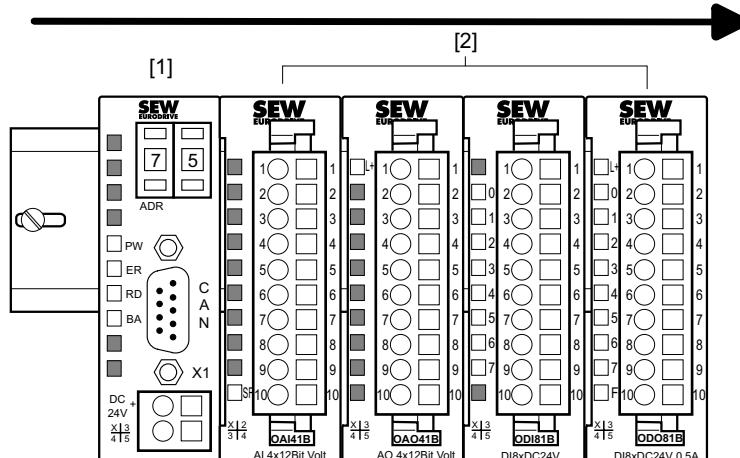
## Installation

### Mechanical installation

#### Mounting position

You can install a maximum of 32 I/O modules vertically or horizontally. You can also add terminal modules. Observe the permitted ambient temperatures:

- Horizontal installation: Ambient temperature of 0 °C to 60 °C

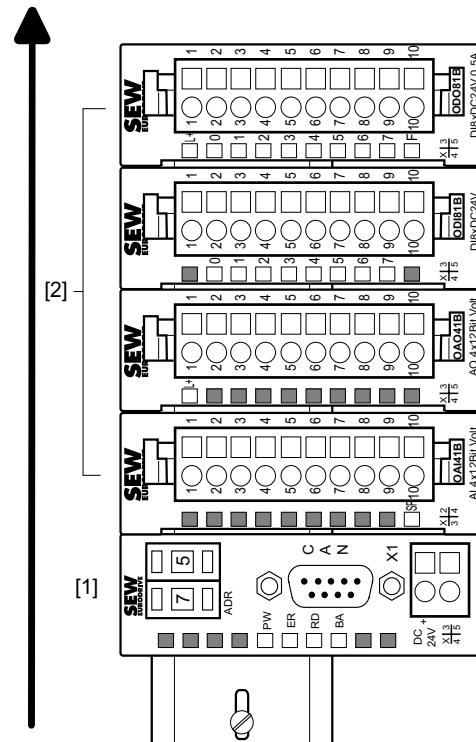


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[1] Bus coupler

[2] I/O modules

- Vertical installation: Ambient temperature of 0 °C to 40 °C



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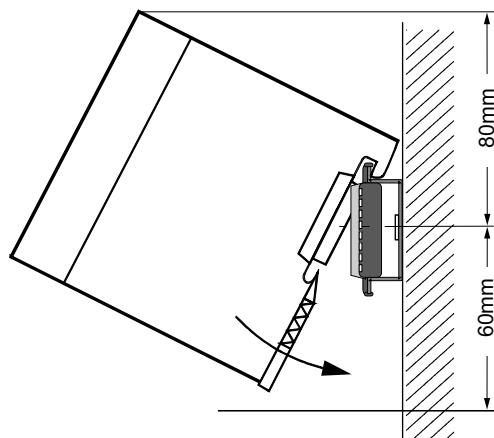
[1] Bus coupler

[2] I/O modules



**Installation clearance**

Ensure a minimum clearance of 80 mm above and 60 mm below the middle of the backplane connector when installing the components.



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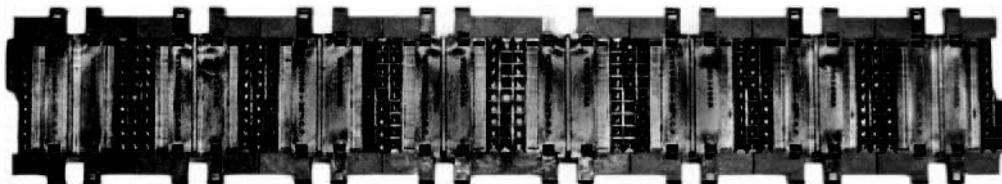


**NOTE**

The switched-mode power supply used may require other installation distances. Please observe the technical data of the switched-mode power supply in use.

**Backplane bus connector**

Insert single-socket or 8-socket backplane bus connectors (→ following figure) into the mounting rail for communication of the I/O modules and terminal modules. The individual plug-in locations for the module are defined by guide rails.



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**NOTES**

- Each I/O module and each terminal module is supplied with a single-socket backplane bus connector. When connecting I/O modules and terminal modules to one bus coupler, replace 8 single-socket backplane connectors by one 8-socket backplane bus connector OBP81B.  
Example: For 20 I/O modules, use two 8-socket backplane bus connectors and four single-socket backplane bus connectors.
- Also refer to the notes in the sections "Step-by-step installation of the MOVI-PLC® I/O system" and "Configuration of I/O modules".
- The switched-mode power supply is not plugged into the backplane bus connector but is installed next to the MOVI-PLC® I/O system.

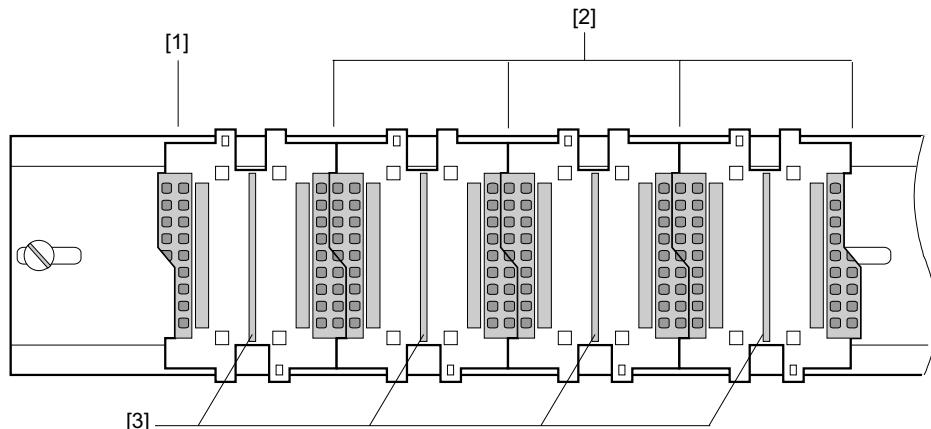


## Installation

### Mechanical installation

#### Installation on mounting rail

Press the backplane bus connector into the mounting rail until it audibly locks in place. The following figure depicts four single-socket backplane connectors used as module slots.



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- [1] Bus coupler slot
- [2] I/O and terminal plug-in locations
- [3] Guide rails

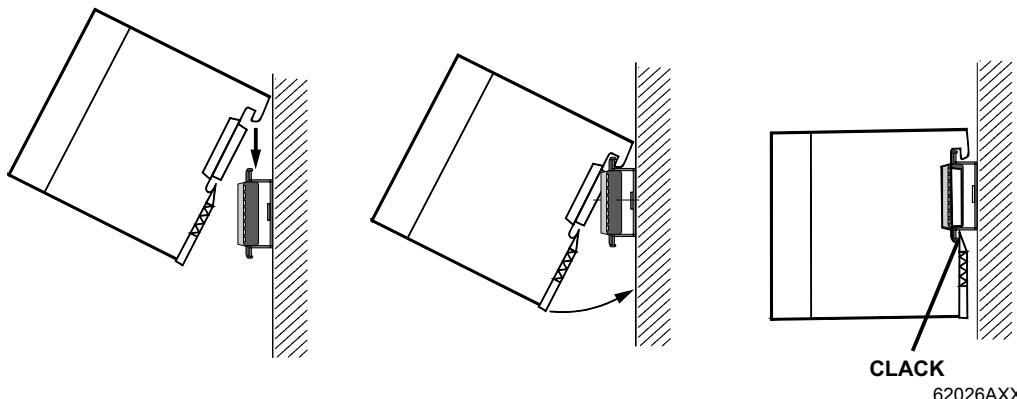


### Step-by-step installation of the MOVI-PLC® I/O system

Proceed as follows to install the keypad:

	<b>STOP!</b> Observe the following points to prevent the I/O module from being damaged: Switch off the power supply before you insert or remove any modules.
	<b>NOTES</b> <ul style="list-style-type: none"> <li>If you operate various modules in a MOVI-PLC® I/O system, follow the specified installation sequence of the modules from perspective of the bus coupler:           <ul style="list-style-type: none"> <li>First plug in the analog input modules directly next to the bus coupler</li> <li>Then plug in the analog output modules next to the analog input modules</li> <li>Finally plug in the digital modules</li> </ul> </li> <li>Arrange the terminal modules as far to the right as possible. You can also plug individual terminal modules at any location between the I/O modules.</li> <li>You can operate up to 32 I/O modules in a MOVI-PLC® I/O system (i.e. at one bus coupler). If you do not use an analog input module, you can plug a total of 32 analog output modules and digital modules in any combination without checking. Terminal modules can be plugged additionally.</li> <li>When using analog input modules, it is important that the total current consumption of all modules via the backplane bus does not exceed the output current of the bus coupler backplane bus. Observe the information in the "Unit design and technical data MOVI-PLC® I/O system" section.</li> <li>Observe the notes in the "Backplane bus connector" and "Configuration of I/O modules" sections.</li> </ul>

1. Install the mounting rail. Ensure the minimum clearance of at least 80 mm above and 60 to below the middle of the profile rail.
2. Insert the backplane bus connector into the profile rail until it audibly locks in place. The bus connections protrude from the rail.
3. Start with the bus coupler at the left and plug in the required I/O modules and terminal modules to the right of the bus coupler.
4. Place the module you want to install from top at an angle of approx. 45 degrees onto the mounting rail and move the module downwards until it audibly locks in place on the mounting rail (→ following figure). Only then will the module be properly connected with the backplane bus.





## Installation

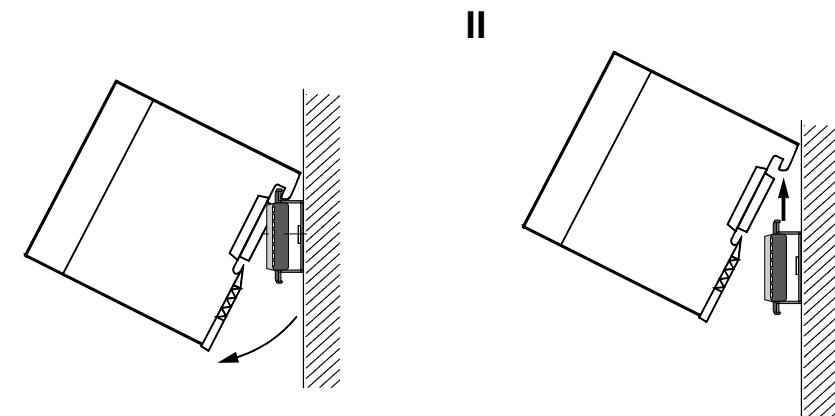
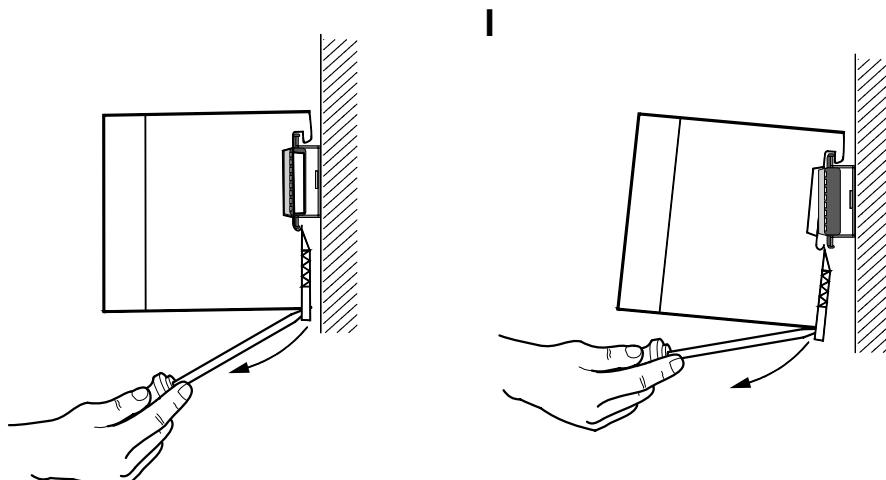
### Mechanical installation

#### **Step-by-step removal of the MOVI-PLC® I/O system**

Proceed as follows for removing modules:

	<b>STOP!</b> Observe the following points to prevent the I/O module from being damaged: Switch off the power supply before you insert or remove a module.
	<b>NOTE</b> The backplane bus is interrupted at the point where the module was removed.

1. The enclosure of the module has a spring-loaded clip at the bottom by which the module can be removed from the rail.
2. Insert a suitable screwdriver into the slot. The module is unlocked by pressing the screwdriver in an upward direction (→ following figure, pos. I).
3. Remove the module toward you slightly turning it to the top (→ following figure, pos. II).



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### 3.2 Electrical installation

#### EMC-compliant installation

- When installing the modules, ensure that any inactive metal components are grounded via a proper large-surface earth.
  - Provide a wide area metal-on-metal contact between the unit housing and ground.
  - Establish a central connection between ground and the earthing/PE system.
  - If possible, do not use any aluminum components.
- Ensure that wiring is routed properly during installation.
  - Route power cables (power current, power supply) and signal cables in separate cable ducts.
  - Route signal cables as close as possible to ground surfaces (e.g. frames, metal rails, sheet metal, etc.).
- Ensure that the shielding of lines is grounded properly.
  - Signal lines must be shielded.
  - Signal lines with analog signals must be shielded. If low-amplitude signals are transferred, it may be advantageous to connect the shield on one side of the cable only.
  - Attach the shields of cables in the control cabinet over a large surface area to the ground rail/PE rail. Secure the line shields using cable clamps.
  - Ensure that the ground rail/PE rail has a low-impedance connection to the control cabinet.
  - Use metallic or metallized plug connector housings for shielded signal lines.
- Use incandescent lamps for illumination inside control cabinets. Do not use fluorescent lamps.
- Create a single reference potential and ground all electrical equipment wherever possible.
  - Ensure that earthing measures are implemented effectively.
  - Provide a star-shaped connection between system components and control cabinets of the MOVI-PLC® I/O system and the earthing/protection system. In this way, you avoid ground loops.
  - Where potential differences exist, you must install sufficiently large equipotential bonding conductors between the different parts of the system and control cabinets.

#### Shielding of lines

Observe the following points when shielding lines:

- Only use lines with braided shield.  
The coverage of the shield should exceed 80 %.
- Always ground the line shields at both ends of cables. High frequency interference can only be suppressed by grounding cables on both ends.
- Always use metallic or metallized connectors for signal lines for serial links. Connect the shield of the signal line to the connector housing. Do not connect the shield to pin 1 of the plug strip of the I/O module.
- For stationary operation, we recommend that you strip the insulation from the shielded cable interruption-free and attach the shield to the shield/protective ground rail.
- Connect braided shields by means of metallic cable clamps. The cable glands must have a good electrical and large surface contact with the shield.



- Attach the shield of a cable to the grounding rail directly where the cable enters the control cabinet. Continue to route the shield right up to the I/O system but do not connect the shield to ground at this point.

	<b>NOTES</b>
	<ul style="list-style-type: none"> <li>• Where potential differences exist between earthing connection, it is possible to establish a compensating current flow where the shield of a cable is connected at both ends.</li> <li>• Make sure you supply adequate equipotential bonding according in accordance with relevant VDE regulations in such a case.</li> </ul>

#### Wiring plug connectors

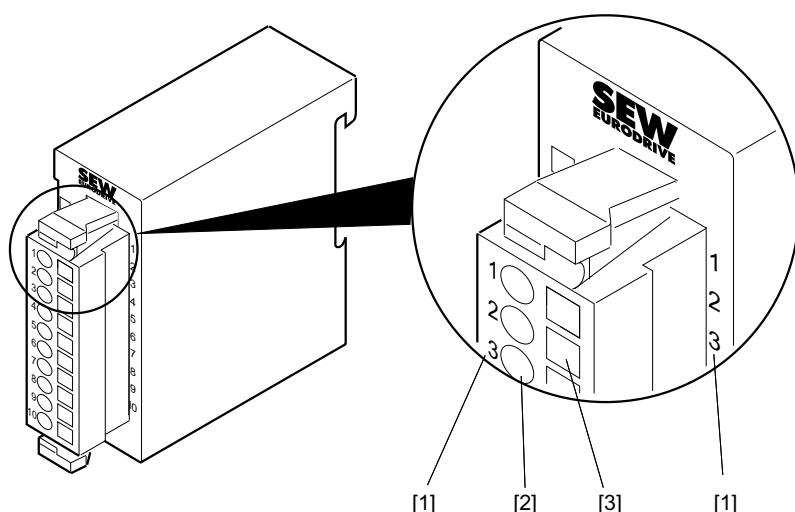
The I/O terminal modules are equipped with a 10-pole connector. This connector provides the electrical interface for the signal and supply lines of the modules.

You can connect cables with a cross section of 0.08 mm<sup>2</sup> to 2.5 mm<sup>2</sup> to the modules.

Connectors with spring-clip technique are used for wiring purposes. The spring-clip technique simplifies the wiring of signal and voltage supply cables.

Unlike screw terminal connections, spring-clip wiring is vibration proof. The connector assignment of the individual modules is explained in the sections on the respective modules.

The following figure shows an I/O module with a 10-pole connector.



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- [1] Pin no.
- [2] Round opening for wires
- [3] Rectangular opening for screw driver



**Procedure for wiring the plug connectors**

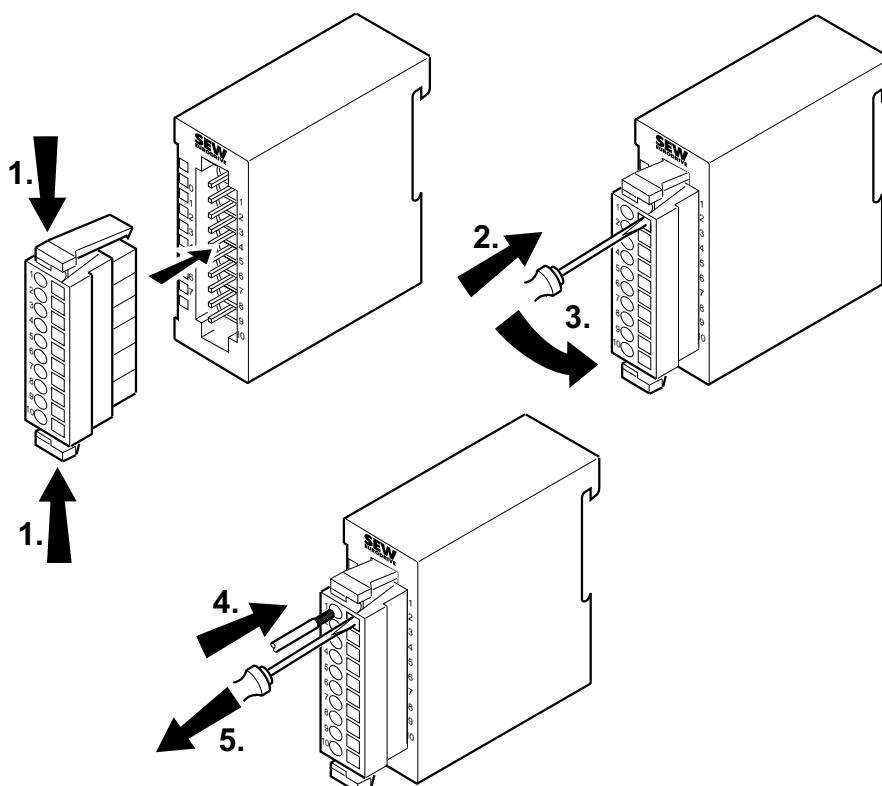
Proceed in the following sequence:

	<b>NOTE</b>
First connect the voltage supply lines, next the signal lines.	

- To install the connector, press the two clips together. Now plug the connector onto the module (→ following figure, step 1). The connector is properly installed when it audibly locks in place.
- Insert a suitable screw driver at an angle into the rectangular opening of the plug connector contact (→ following figure, step 2). Press and hold the screw driver in the opposite direction to open the contact spring (→ following figure, step 3).

	<b>STOP!</b>
<p>The spring-clip is destroyed if you insert the screw driver into the round opening for the wires.</p> <p>Make sure that you only insert the screw driver into the rectangular opening of the connector.</p>	

- Insert the stripped end of the wire into the round opening. You can use wires with a cross section of 0.08 mm<sup>2</sup> to 2.5 mm<sup>2</sup> to the I/O terminal modules (→ following figure, step 4).
- Remove the screw driver from the rectangular opening (→ following figure, step 5). The wire is now clipped securely to the connector.



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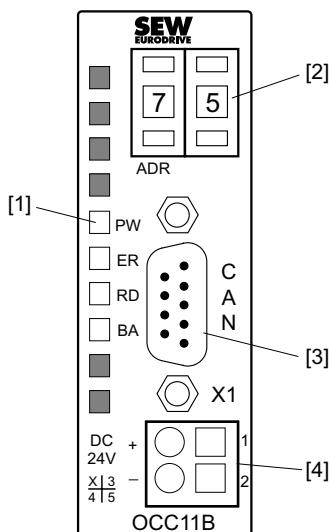


## 4 Unit Design and Technical Data of the MOVI-PLC® I/O System

### 4.1 CAN bus coupler OCC11B

**Part number** 1821 479 7

**Description** The CAN bus coupler OCC11B (→ following figure) connects the MOVI-PLC® I/O system with the MOVI-PLC® controller via the system bus from SEW-EURODRIVE. It supports all CAN transmission rates.



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- [1] LED status indicators
- [2] Address adjuster for setting baud rate and module ID
- [3] CAN bus plug connector
- [4] Port for external DC 24 V supply voltage

**Diagnostics LED** The CAN bus coupler OCC11B comes equipped with 4 diagnostics LEDs.

LED	Color	LED status / meaning
PW	Green	Lights up if operating voltage is present.
ER	Red	Lights up if error occurs during backplane bus transfer
RD	Green	<ul style="list-style-type: none"> <li>• Flashes with 1 Hz if self-test was positive and initialization successful</li> <li>• Lights during data transmission via SBus</li> </ul>
BA	Yellow	<ul style="list-style-type: none"> <li>• Off if self-test was positive and initialization successful</li> <li>• Flashes with 1 Hz in "pre-operational" status</li> <li>• Lights up in "operational" status</li> <li>• Flashes with 10 Hz in "prepared" status</li> </ul>



### Combinations

A combination of diagnostics LEDs indicates various states.

LED status	Meaning
PW on ER on RD on BA on	Error during RAM or EEPROM initialization.
PW on ER flashes with 1Hz RD flashes with 1 Hz BA flashes with 1 Hz	Baud rate setting activated.
PW on ER flashes with 10Hz RD flashes with 10 Hz BA flashes with 10Hz	Incorrect CAN baud rate setting. (no ACK from the bus master)
PW on ER off RD flashes with 1 Hz BA off	Module ID setting activated.

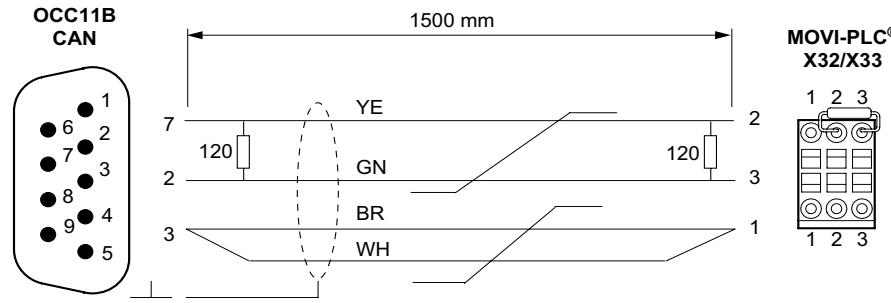
### CAN plug connector assignment

The CAN bus coupler OCC11B is connected to the MOVI-PLC® controller (X32 or X33 terminal) using a 9-pin plug connector ("CAN" socket).

9-pin plug connector "CAN"	PIN	Assignment
	1	Not assigned
	2	CAN low
	3	CAN ground
	4	Not assigned
	5	Not assigned
	6	Not assigned
	7	CAN high
	8	Not assigned
	9	Not assigned

### CAN bus cabling

- For connecting the OCC11B bus coupler to the MOVI-PLC® controller (X32 or X33 terminal), use the prefabricated cable of SEW-EURODRIVE (length: 1.5 m) with integrated terminating resistors.
  - Part number of the prefabricated cable: 1810 482 7



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- You can connect more MOVI-PLC I/O systems to the X32/X33 connector of the MOVI-PLC® controller. To do so, remove the 120 Ω terminating resistor.



	<b>NOTES</b>
	<ul style="list-style-type: none"> <li>• CAN bus uses a shielded three-wire line as transmission medium.</li> <li>• In systems with more than two stations, all stations are wired in parallel. The bus cable must be looped without interruption for this purpose.</li> <li>• The bus cable must always be connected with a terminating resistor of <math>120\ \Omega</math> on the line ends to avoid reflections and consequently transmission problems.</li> </ul>

**Voltage supply**

The CAN bus coupler OCC11B comes equipped with an integrated power supply unit. The power supply unit must be supplied with DC 24 V. The supply voltage supplies the bus coupler electronics and the connected I/O modules via the backplane bus. The power supply unit is protected against damage in the event of reverse polarity or overcurrent. CAN bus and backplane bus are electrically isolated from each other.

	<b>NOTE</b>
	Correct polarity of the voltage supply at the X1 plug connector is required to avoid failure of the bus coupler.

**Setting the baud rate using the address adjuster**

Use the address adjuster to set the CAN baud rate and the module ID.

- Set address 00 on the address adjuster.
- Activate the voltage supply for the CAN bus coupler.

The diagnostic LEDs "ER", "RD" and "BA" flash with 1 Hz. Now you have 5 seconds time to programm the CAN baud rate using the address adjuster.

Address adjuster	CAN baud rate	Maximum bus length
00	1 MBaud	25 m
01	500 kBaud (factory setting)	100 m
02	250 kbaud	250 m
03	125 kbaud	500 m
04	100 kbaud	600 m
05	50 kbaud	1000 m
07	20 kbaud	2500 m
08	800 kBaud	50 m

The CAN baud rate will be saved after 5 seconds.



**Setting the module ID**

	<b>NOTE</b> <ul style="list-style-type: none"> <li>The module ID must be set when you have set the baud rate and before switching on the bus coupler again.</li> <li>Each module ID must only be assigned to the CAN bus once. Do not connect any inverters to the CAN bus.</li> </ul>
	<ul style="list-style-type: none"> <li>The "ER" and "BA" diagnostics LEDs go out and the green "RD" LED continues to flash.</li> <li>Use the address adjuster to set the module ID in the range from 1 to 63.</li> <li>The settings will be accepted after 5 seconds and the bus coupler enters normal operation ("pre-operational" status).</li> </ul>

**Technical data**

<b>Electrical data of OCC11B</b>	
Voltage supply X1	X1:1 DC+24 V input (20.4 V ... 28.8 V) X1:2 Reference 24 V
Current consumption	Max. DC 0.7 A
Output current backplane bus	Max. DC 3.5 A
Galvanic isolation	AC 500 V
Status display	LEDs on the front panel
Connections/interfaces	CAN bus: 9-pin sub-D connector
<b>CAN bus interface</b>	
Coupling	9-pin sub-D connector
Network topology	Linear bus, active bus termination at one end, spur lines are possible
Medium	Shielded, three-wire cable. Depending on the ambient conditions, shielding is not necessary.
Transmission rate	10 kBaud ... 1 MBaud (factory setting: 500 kBaud)
Maximum total length	Without repeater: 1000 M at 50 kBaud
Binary inputs / outputs	Max. 32 I/O modules can be combined per bus coupler
Maximum number of stations	63 stations
Address setting	1 ... 63 (factory setting: 1)
<b>Combination with I/O modules</b>	
Maximum number of modules	32
<b>Dimensions and weight</b>	
Dimensions (W xH xD) in mm	25.4 x76 x78
Weight	80 g

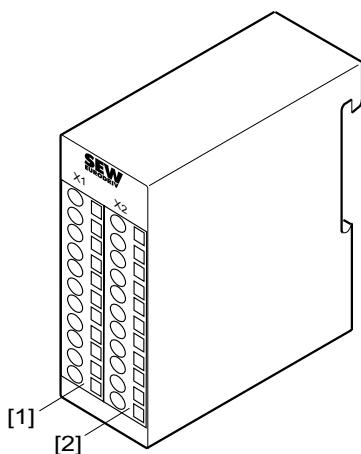


## 4.2 OTM21B terminal module

**Part number** 1821 490 8

**Description** The OTM21B terminal module is a complementary module for 2-wire or 3-wire installation. The module is not connected to the backplane bus.

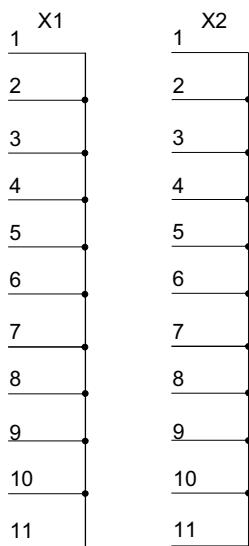
- 2 separate rows with 11 electrically interconnected terminals.
- No connection to the backplane bus
- Maximum terminal current DC 10 A



62077AXX

- [1] First terminal strip
- [2] Second terminal strip

### Wiring diagram



62078AXX



**Technical data**

<b>Electrical data of OTM12B</b>	
Number of rows	2
Number of terminals per row	11
Maximum terminal current	DC 10 A
Terminal color	Gray
<b>Dimensions and weight</b>	
Dimensions (W ×H ×D) [mm]	25.4 × 76 × 88
Weight	50 g

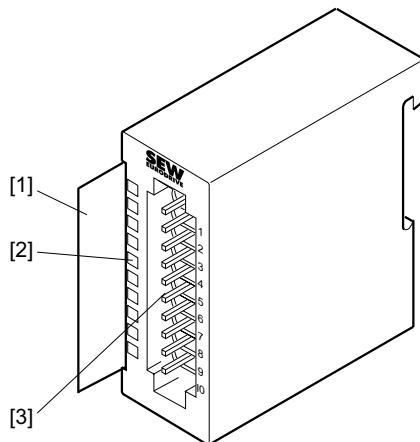


### 4.3 ODI81B digital input module

**Part number** 1821 481 9

**Description** The ODI81B digital input module has 8 binary inputs, each one with an LED to indicate the status.

- 8 binary inputs, galvanically isolated from the backplane bus
- DC 24 V rated input voltage
- LED status indicator for binary inputs



62259AXX

- [1] Label for the bit address with description
- [2] LED status indicator for binary inputs
- [3] Connector strip

#### Connector assignment

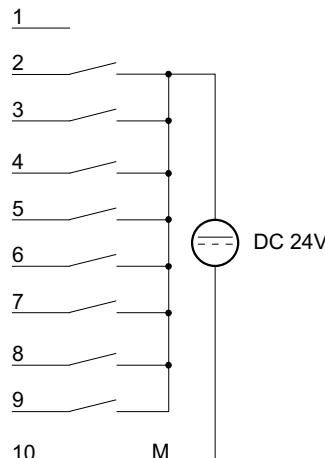
ODI81B	Terminal/LED	Assignment/description
	1	Not assigned
	2	Binary input 0
	3	Binary input 1
	4	Binary input 2
	5	Binary input 3
	6	Binary input 4
	7	Binary input 5
	8	Binary input 6
	9	Binary input 7
	10	Weight
	LED 0 ... 7	Status indicator for binary inputs 0 ... 7

62050AXX



**LED status indicator** LEDs 0 ... 7 light up green if signal "1" is detected from approx. DC 15 V onwards.

### **Wiring diagram**



62061AXX

### **Technical data**

<b>Electrical data of ODI81B</b>	
Number of binary inputs	8
Rated input voltage	DC 24 V (20.4 ... 28.8 V)
Signal voltage "0"	0 ... 5 V
Signal voltage "1"	15 ... 28.8 V
Input filter time delay	3 ms
Input current	typ. 7 mA
Current consumption from backplane bus	DC 25 mA
Galvanic isolation	500 V <sub>rms</sub> (field voltage to the bus)
Status indicator	via LEDs located on the front
<b>Programming data</b>	
Input data	1 byte
Output data	-
Diagnostic data	-
<b>Dimensions and weight</b>	
Dimensions (W × H × D) [mm]	25.4 × 76 × 88
Weight	50 g



**Parameter setting** Make the following settings in the module parameters (→ section "Parameter setting of I/O modules"). The settings refer to up to eight ODI81B digital input modules of the PLC configuration entry. Default settings are printed in bold.

Module parameters	Setting range
Transmit mode	<b>Acyclic / cyclic</b>
Inhibit time	0 ... <b>5</b> ... 500 ms
Event time	<b>0</b> ... 500 ms

- If the module parameter "TransmitMode" is set to "acyclic", process data will be transmitted between MOVI-PLC® controller and MOVI-PLC® I/O system in the event of modification. In this case, the module parameter "Event Time" indicates an additional cyclic transmission rate.
- If the module parameter "TransmitMode" is set to "cyclic", the "Event Time" indicates the transmission rate for cyclic process data transmission.
- The module parameter "Inhibit Time" indicates in all cases a minimum duration between process data transmissions.

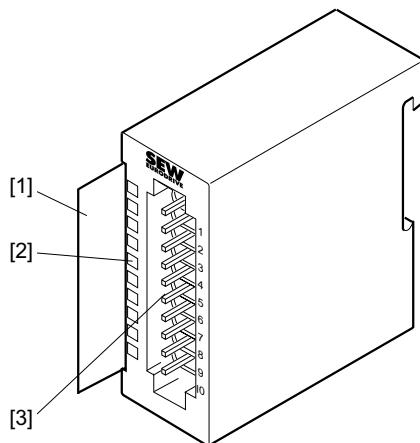


#### **4.4 ODO81B digital output module**

**Part number** 1821 482 7

**Description** The ODI81B digital output module has 8 binary outputs, each one with an LED to indicate the status.

- 8 binary outputs, galvanically isolated from the backplane bus
- Power supply voltage DC 24 V
- Output current DC 0.5 A
- Status indicated by LED



62059AXX

- [1] Label for the bit address with description
- [2] LED status indicator
- [3] Connector strip

#### **Connector assignment**

<b>ODO81B</b>	<b>Termin-al/LED</b>	<b>Assignment/description</b>
	1	Power supply voltage DC 24 V
	2	Binary output 0
	3	Binary output 1
	4	Binary output 2
	5	Binary output 3
	6	Binary output 4
	7	Binary output 5
	8	Binary output 6
	9	Binary output 7
	10	Weight
	LED + LED F LED 0 ... 7	Green: DC 24 V present Red: An error occurred Green: Binary output active

62068AXX

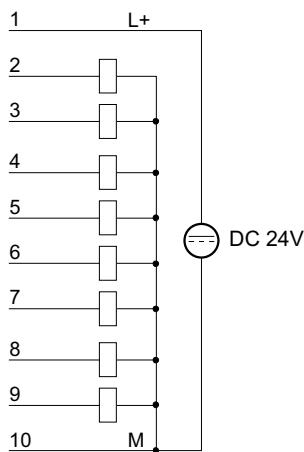


**LED +** The "+" LED lights up green if the DC 24 V supply voltage is present.

**LED 0 ... 7 Status display** LEDs 0 ... 7 light up green if a binary output is active.

**'F' LED** The "F" LED lights up red if an error occurs caused by overload, overheating, or short circuit.

#### **Wiring diagram**



62062AXX

#### **Technical data**

<b>Electrical data of ODI81B</b>	
Number of binary outputs	8
Rated load voltage	DC 24 V (20.4 ... 28.8 V)
Current consumption at L+ without load from backplane bus	DC 10 mA DC 70 mA
Output current per channel	0.5 A short-circuit proof
Total current	4 A
Voltage supply	DC 24 V (20.4 V ... 28.8 V)
Galvanic isolation	500 V <sub>rms</sub> (field voltage to the bus)
Status indicator	via LEDs located on the front
<b>Programming data</b>	
Input data	-
Output data	1 byte
Diagnostic data	-
<b>Dimensions and weight</b>	
Dimensions (W × H × D) [mm]	25.4 × 76 × 88
Weight	50 g



**Parameter setting** Make the following settings in the module parameters (→ section 5.6). The settings refer to up to eight ODO81B digital output modules of the PLC configuration entry. Default settings are printed in bold.

Module parameters	Setting range
Transmit mode	<b>Acyclic</b> / cyclic
Inhibit time	0 ... <b>5</b> ... 500 ms
Event time	<b>0</b> ... 500 ms

- If the module parameter "TransmitMode" is set to "acyclic", process data will be transmitted between MOVI-PLC® controller and MOVI-PLC® I/O system in the event of a modification. In this case, the module parameter "Event Time" indicates an additional cyclic transmission rate.
- If the module parameter "TransmitMode" is set to "cyclic", the "Event Time" indicates the transmission rate for cyclic process data transmission.
- The module parameter "Inhibit Time" indicates in all cases a minimum duration between process data transmissions.

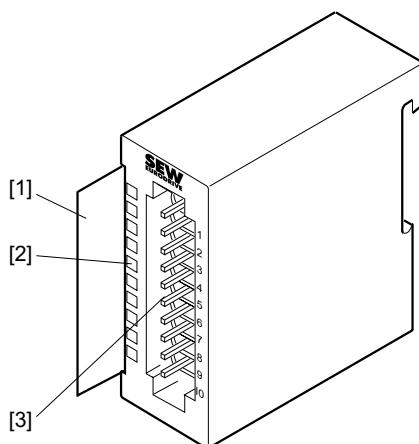


#### 4.5 OAI41B analog input module (voltage)

**Part number** 1821 483 5

**Description** The OAI41B analog input module has 4 inputs, each with an LED to indicate the status. The OAI41B input module requires a total of 8 bytes of the process image for the input data (2 bytes per channel). The channels on the OAI41B input module are galvanically isolated from the backplane bus by means of DC/DC converters.

- 4 analog inputs; channels galvanically isolated from the backplane bus
- The different channels can be configured individually and can be deactivated
- Suitable for encoders with  $\pm 10$  V
- LED status indicator



62059AXX

- [1] Label for the bit address with description
- [2] LED status indicator
- [3] Connector strip



**Connector assignment**

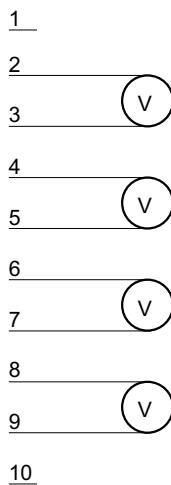
OAI41B	Terminal/LED	Assignment/description
	1	Not assigned
	2	Positive connection channel 0
	3	Ground channel 0
	4	Positive connection channel 1
	5	Ground channel 1
	6	Positive connection channel 2
	7	Ground channel 2
	8	Positive connection channel 3
	9	Ground channel 3
	10	Not assigned
'SF' LED		Lights up red if • parameters are set incorrectly • the upper or lower limit of the control range is exceeded
		62053AXX

**'SF' LED**

The 'SF' LED lights up red if

- the upper or lower limit of the control range is exceeded
- parameters are set incorrectly

**Wiring diagram**



62063AXX



**NOTE**

Connect temporarily unused inputs with activated channel to the associated ground to obtain defined values at these channels.



## Unit Design and Technical Data of the MOVI-PLC® I/O System

### OAI41B analog input module (voltage)

#### Function assignment

You set the functions in the PLC Editor in the PLC configuration in the module parameters of the I/O module (→ section "Parameter setting of I/O modules"). Default settings are printed in bold.

Module parameters	Setting range	Description/measuring range/representation
Event time	0 ... <b>10</b> ... 500 ms	The "Event time" is used to set the transmission rate for cyclic data transmission between MOVI-PLC® and MOVI-PLC® I/O system.
Mode channel 1 ... 4	<b>-10 ... 10 V</b> <b>(-27648 ... 27648)</b>	DC ±11.76 V DC 11.76 V = Max. value overdrive range (32511) DC -10 V ... 10 V = Rated range (-27648 ... 27648) DC -11.76 V = Max. value underdrive range (-32512) Two's complement
	-10 ... 10 V (-16348 ... 16348)	DC ±12.50 V DC 12.50 V = Max. value overdrive range (20480) DC -10 V ... 10 V = Rated range (-16384 ... 16384) DC -12.50 V = Min. value underdrive range (-20480) Two's complement
	Not active	-



#### NOTE

The default setting of the I/O module OAI41B is "-10 ... 10 V (-27648 ... 27648)".

#### Technical data

Electrical data of OAI41B	
Number of analog inputs	4
Cable length (shielded)	200 m
Voltages, currents, potentials	
Galvanic isolation Channel/backplane bus between the channels	Yes No
Permitted potential difference between inputs between inputs and M <sub>internal</sub> (U <sub>iso</sub> )	DC 2 V DC 75 V/AC 60 V
Insulation tested at	DC 500 V
Current consumption from backplane bus	DC 120 mA
Power loss of the I/O module	0.6 W
Analog value generation	
Measuring principle	SAR (successive approximation)
Parameterizable	Yes
Conversion time/resolution (per channel) Basic conversion time (ms) Resolution (bit) including overdrive range	n×2 ms 13 bit
Interference suppression, error limits	
Interference suppression for f = n × (f <sub>1</sub> ±1 %) (f <sub>1</sub> = interfering frequency; n = 1, 2, ...)	f = 50 Hz ... 400 Hz
Common-mode interference (U <sub>CM</sub> < 2 V)	> 80 dB
Interference between inputs	> 50 dB
Operational limits (over entire temperature range, referred to input)	
Voltage input	Measuring range ±10 V / tolerance ±0.2 %



<b>Electrical data of OAI41B</b>	
<b>Basic error limit (operational limit at 25 °C, referred to input)</b>	
Voltage input	Measuring range ±10 V / tolerance ±0.1 %
Temperature error (referred to input)	±0.005 %/K
Linearity error (referred to input range)	±0.02 %
Repeatability (under steady-state conditions, at 25 °C, referred to input range)	±0.05 %
Diagnostics	No
Diagnostics interrupt	No
Fault display for group fault	'SF' LED (red)
<b>Encoder selection data</b>	
Voltage	Input range: ±10 V/input resistance: 100 kΩ
Permitted input voltage for voltage input (destruction limit)	Max. 30 V
Voltage measurement	Possible
<b>Permitted ambient conditions</b>	
Operating temperature	0 °C ... 60 °C
Transport and storage temperature	-25 °C ... 70 °C
Relative humidity	95 % without condensation
vibration and shock resistance	According to IEC 68000-2/IEC 68000-2-27
EMC resistance ESD/burst	According to IEC 61000-4-2 IEC 61000-4-2/IEC 61000-4-4 (up to level 3)
<b>Programming data</b>	
Input data	8 bytes (1 word per channel)
Output data	-
<b>Dimensions and weight</b>	
Dimensions (W ×H ×D) [mm]	25.4 × 76 × 88
Weight	ca. 80 g

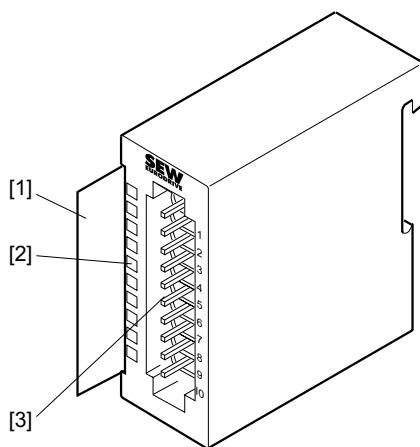


#### 4.6 OAI42B analog input module (current)

**Part number** 1821 484 3

**Description** The analog input module OAI42B has 4 inputs. Their functions can be configured individually. The OAI42B input module requires a total of 8 bytes of the process image for the input data (2 bytes per channel). The channels on the OAI42B input module are galvanically isolated from the backplane bus by means of DC/DC converters.

- 4 analog inputs; channels galvanically isolated from the backplane bus
- The different channels can be configured individually and can be deactivated.
- Suitable for encoders with 4 ... 20 mA, ±20 mA
- LED status indicator



62059AXX

- [1] Label for the bit address with description
- [2] LED status indicator
- [3] Connector strip



**Connector assignment**

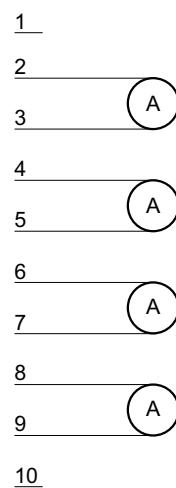
OAI42B		Terminal/LED	Assignment/description
		1	Not assigned
		2	Positive connection channel 0
		3	Ground channel 0
		4	Positive connection channel 1
		5	Ground channel 1
		6	Positive connection channel 2
		7	Ground channel 2
		8	Positive connection channel 3
		9	Ground channel 3
		10	Not assigned
	'SF' LED		Lights up red if • parameters are set incorrectly • the upper or lower control limit is exceeded
			62055AXX

**'SF' LED**

The 'SF' LED lights up red if

- the upper or lower control limit is exceeded
- if parameters are set incorrectly

**Wiring diagram**



62064AXX

**NOTE**



Connect temporarily unused inputs with activated channel to the associated ground to obtain defined values at these channels.



## Unit Design and Technical Data of the MOVI-PLC® I/O System

### OAI42B analog input module (current)

#### Function assignment

You set the functions in the PLC configuration in the PLC Editor in the module parameters of the I/O module (→ section "Parameter setting of I/O modules"). Default settings are printed in bold.

Module parameters	Setting range	Description/measuring range/representation
Event time	0 ... <b>10</b> ... 500 ms	The "Event time" is used to set the transmission rate for cyclic data transmission between MOVI-PLC® and MOVI-PLC® I/O system.
Mode channel 1 ... 4	<b>4 ... 20 mA</b> (0 ... 27648)	DC 1.185 ... 22.81 mA DC 22.81 mA = Max. value overdrive range (32511) DC 4 ... 20 mA = Rated range (0 ... 27648) DC 1.185 mA = Minimum value underdrive range (-4864) Two's complement
	-20 ... 20 mA (-27648 ... 27648)	DC ±23.52 mA DC 23.52 mA = Max. value overdrive range (32511) DC -20 mA ... 20 mA = Rated range (-27648 ... 27648) DC -23.52 V = Min. value underdrive range (-32512) Two's complement
	<b>4 ... 20 mA</b> (0 ... 16384)	DC 0.8 ... 24 mA DC 24 mA = Max. value overdrive range (32511) DC 4 ... 20 mA = Rated range (0 ... 16384) DC 0.8 mA = Min. value underdrive range (-3277) Two's complement
	-20 ... 20 mA (-16384 ... 16384)	DC ±25 mA DC 25 mA = Max. value overdrive range (20480) DC -20 mA ... 20 mA = Rated range (-16384 ... 16384) DC -25 mA = Min. value underdrive range (-20480) Two's complement
	Not active	-



#### NOTE

The default setting of the I/O module OAI42B is "4 ... 20 mA (0 ... 27648)".

#### Technical data

Electrical data of OAI42B	
Number of analog inputs	4
Cable length (shielded)	200 m
Voltages, currents, potentials	
Galvanic isolation Channel/backplane bus between the channels	Yes No
Permitted potential difference between inputs between inputs and M <sub>internal</sub> (U <sub>iso</sub> )	DC 2 V DC 75 V / AC 60 V
Insulation tested at	DC 500 V
Current consumption from backplane bus	DC 120 mA
Power loss of the I/O module	0.6 W
Analog value generation	
Measuring principle	SAR (successive approximation)
Parameterizable	Yes
Conversion time/resolution (per channel) Basic conversion time (ms) Resolution (bit) including overdrive range	n×2 ms 13 bit



<b>Electrical data of OAI42B</b>	
<b>Interference suppression, error limits</b>	
Interference suppression for $f = n \times (f_1 \pm 1\%)$ ( $f_1$ = interfering frequency; $n = 1, 2, \dots$ )	$f = 50 \text{ Hz} \dots 400 \text{ Hz}$
Common-mode interference ( $U_{CM} < 2 \text{ V}$ )	> 80 dB
Interference between inputs	> 50 dB
<b>Operational limits (over entire temperature range, referred to input)</b>	
Current input	Measuring range $\pm 20 \text{ mA}$ / tolerance $\pm 0.2\%$ Measuring range $4 \dots 20 \text{ mA}$ / tolerance $\pm 0.5\%$
<b>Basic error limit (operational limit at 25 °C, referred to input)</b>	
Current input	Measuring range $\pm 20 \text{ mA}$ / tolerance $\pm 0.1\%$ Measuring range $4 \dots 20 \text{ mA}$ / tolerance $\pm 0.2\%$
Temperature error (referred to input range)	$\pm 0.005\%/\text{K}$
Linearity error (referred to input range)	$\pm 0.02\%$
Repeatability (under steady-state conditions, at 25 °C, referred to input range)	$\pm 0.05\%$
Diagnostics	No
Diagnostics interrupt	No
Fault display for group fault	'SF' LED (red)
<b>Encoder selection data</b>	
Current	Input range $\pm 20 \text{ mA}$ / input resistance $60\Omega$ Input range $4 \dots 20 \mu\text{A}$ / input resistance $60\Omega$
Permitted input current for current input (destruction limit)	40 mA
Voltage measurement as 2-wire transducer as 4-wire transducer	Possible, with external supply Possible
<b>Permitted ambient conditions</b>	
Operating temperature	0 °C ... 60 °C
Transport and storage temperature	-25 °C ... 70 °C
Relative humidity	95 % without condensation
Vibration and shock resistance	According to IEC 68000-2/IEC 68000-2-27
EMC resistance ESD/burst	According to IEC 61000-4-2 IEC 61000-4-2/IEC 61000-4-4 (up to level 3)
<b>Programming data</b>	
Input data	8 bytes (1 word per channel)
Output data	-
<b>Dimensions and weight</b>	
Dimensions (W x H x D) [mm]	25.4 x 76 x 88
Weight	ca. 80 g

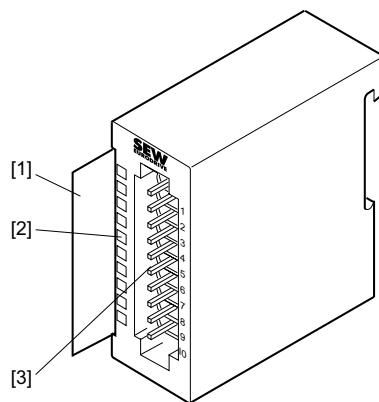


#### 4.7 OAI43B analog input module (multi-input)

**Part number** 1821 485 1

**Description** The OAI43B analog input module has 4 inputs. Their functions can be configured individually. The OAI43B input module requires a total of 8 bytes of the process image for the input data (2 bytes per channel). The channels on the OAI43B input module are galvanically isolated from the backplane bus by means of DC/DC converters.

- The different channels can be configured individually and can be deactivated.
- The common signal inputs of the channels are not isolated from each other; the permitted potential difference is up to 5 V.
- Diagnostic function



62059AXX

- [1] Label for the bit address with description
- [2] LED status indicator
- [3] Connector strip

**Connector assignment**

OAI43B	Terminal/LED	Assignment/description
	1	Channel 0 with 4-wire connection
	2	Positive connection channel 0
	3	Ground channel 0
	4	Positive connection channel 1
	5	Ground channel 1
	6	Positive connection channel 2
	7	Ground channel 2
	8	Positive connection channel 3
	9	Ground channel 3
	10	Channel 2 with 4-wire connection
	LED F0 ... F3	Lights up red if <ul style="list-style-type: none"> <li>• an error occurs in one of the channels</li> <li>• an entry was made in the diagnostic bytes</li> </ul>

62057AXX

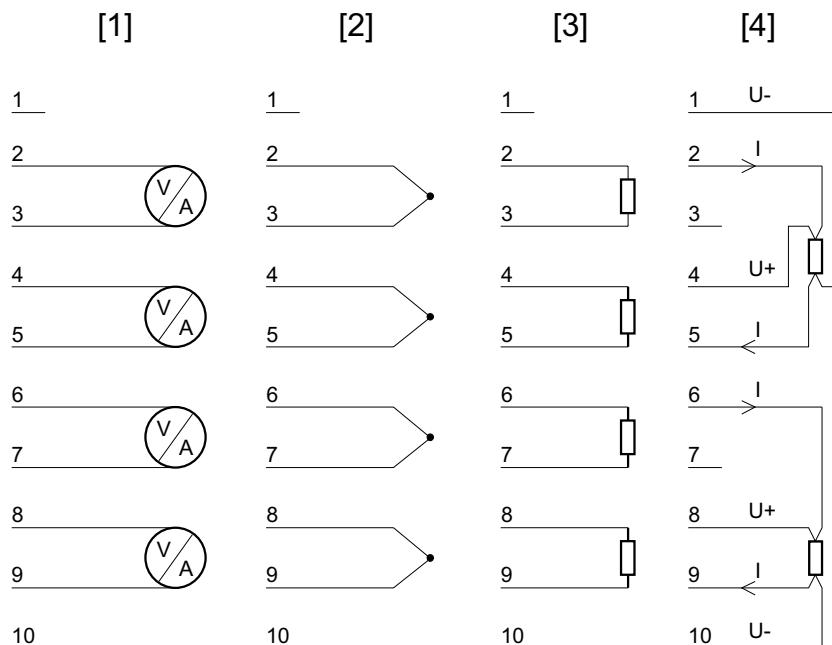


**LEDs F0 ... F3** The LEDs F0 ... F3 light up red if

- an error occurs in one of the channels
- an entry was made in the diagnostic bytes

**Wiring diagram**

The following figure shows the connection options for the various measuring ranges. For an assignment to the measuring ranges, refer to the "Connection" column in the "Function assignment" section.



62065AXX



**NOTE**

Connect temporarily unused inputs with activated channel to the associated ground to obtain defined values at these channels.



**STOP!**

Observe the following points to prevent the I/O module from being damaged:

- The parameterized measuring range must correspond with the connected encoder.
- Do not connect a voltage > DC 15 V to the input.



## Unit Design and Technical Data of the MOVI-PLC® I/O System

### OAI43B analog input module (multi-input)

#### **Function assignment**

A function number is assigned to a channel by setting the module parameters (→ section "Parameter setting of I/O modules"). The function number 00<sub>hex</sub> means the function number stored permanently in the parameter setting data is not influenced.

You can disable a channel by specifying FF<sub>hex</sub>.

Module parameters	No. hex	Setting range / function	Description / measuring range / representation	Wiring diagram
Event time	-	0 ... 10 ... 500 ms	The "Event time" is used to set the transmission rate for cyclic data transmission between MOVI-PLC® and MOVI-PLC® I/O system.	-
Module mode	-	-	The "Module mode" module parameter is used to set whether the OAI43B analog input module is to generate a diagnostics interrupt or not. In this case, the diagnostic information will be output at the MPLC_ConnectSEW-IOSystem_CAN function module (→ section "IEC program"). You find more information in the "MPLCUtilities Library for MOVI-PLC®" manual. Bit 0 ... 5, 7 : Reserved Bit 6: <ul style="list-style-type: none"><li>• 0 = Diagnostic interrupt disabled</li><li>• 1 = Diagnostic interrupt enabled</li></ul>	-



Module parameters	No. hex	Setting range / function	Description / measuring range / representation	Wiring diagram
Mode channel 1 ... 4	00	The function number in the permanently stored parameter setting data is not changed.		
	01	Pt100 in the 2-wire connection	-200 °C ... 850 °C Unit: 1/10 °C; two's complement	[3]
	02	Pt1000 in the 2-wire connection	-200 °C ... 850 °C Unit: 1/10 °C; two's complement	[3]
	03	NI100 in the 2-wire connection	-60 °C ... 250 °C Unit: 1/10 °C; two's complement	[3]
	04	NI1000 in the 2-wire connection	-60 °C ... 250 °C Unit: 1/10 °C; two's complement	[3]
	05	Resistance measurement 60 Ω two-wire	60 Ω = end value (32767)	[3]
	06	Resistance measurement 60 Ω two-wire	600 Ω = end value (32767)	[3]
	07	Resistance measurement 3000 Ω two-wire	3000 Ω = end value (32767)	[3]
	08	Resistance measurement 6000 Ω two-wire	6000 Ω = end value (32767)	[3]
	09	Pt100 in the 4-wire connection	-200 °C ... 850 °C Unit: 1/10 °C; two's complement	[4]
	0A	Pt1000 in the 4-wire connection	-200 °C ... 850 °C Unit: 1/10 °C; two's complement	[4]
	0B	NI100 in the 4-wire connection	-60 °C ... 250 °C Unit: 1/10 °C; two's complement	[4]
	0C	NI1000 in the 4-wire connection	-60 °C ... 250 °C Unit: 1/10 °C; two's complement	[4]
	0D	Resistance measurement 60 Ω four-wire	60 Ω = end value (32767)	[4]
	0E	Resistance measuring 60 Ω four-wire	600 Ω = end value (32767)	[4]
	0F	Resistance measuring 3000 Ω four-wire	3000 Ω = end value (32767)	[4]
	10	Thermocouple type J <sup>1)</sup> , externally compensated	-210 °C ... 1200 °C Unit: 1/10 °C, two's complement	[2]
	11	Thermocouple type K <sup>1)</sup> , externally compensated	-270 °C ... 1372 °C Unit: 1/10 °C, two's complement	[2]
	12	Thermocouple type N <sup>1)</sup> , externally compensated	-270 °C ... 1300 °C Unit: 1/10 °C, two's complement	[2]
	13	Thermocouple type R <sup>1)</sup> , externally compensated	-50 °C ... 1769 °C Unit: 1/10 °C, two's complement	[2]
	14	Thermocouple type T <sup>1)</sup> , externally compensated	-270 °C ... 400 °C Unit: 1/10 °C, two's complement	[2]
	15	Thermocouple type S <sup>1)</sup> , externally compensated	-50 °C ... 1769 °C Unit: 1/10 °C, two's complement	[2]
	16	Thermocouple type E <sup>1)</sup> , externally compensated	-270 °C ... 1000 °C Unit: 1/10 °C, two's complement	[2]
	18	Thermocouple type J <sup>2)</sup> , internally compensated	-210 °C ... 1200 °C Unit: 1/10 °C, two's complement	[2]
	19	Thermocouple type K, internally compensated	-270 °C ... 1372 °C Unit: 1/10 °C, two's complement	[2]
	1A	Thermocouple type N, internally compensated	-270 °C ... 1300 °C Unit: 1/10 °C, two's complement	[2]
	1B	Thermocouple type R, internally compensated	-50 °C ... 1769 °C Unit: 1/10 °C, two's complement	[2]
	1C	Thermocouple type T, internally compensated	-270 °C ... 400 °C Unit: 1/10 °C, two's complement	[2]
	1D	Thermocouple type S, internally compensated	-50 °C ... 1769 °C Unit: 1/10 °C, two's complement	[2]



## Unit Design and Technical Data of the MOVI-PLC® I/O System

### OAI43B analog input module (multi-input)

Module parameters	No. hex	Setting range / function	Description / measuring range / representation	Wiring diagram
Mode channel 1 ... 4	1E	Thermocouple type E, internally compensated	-270 °C ... 1000 °C Unit: 1/10 °C, two's complement	[2]
	27	Voltage DC $\pm$ 50 mV (-27648 ... 27648)	DC $\pm$ 58.79 mV DC 58.79 mV = Max. value overdrive range (32511) DC -50 ... 50 mV = Rated voltage (-27648 ... 27648) DC -58.79 mV = Min. value underdrive range (-32512) Two's complement	[1]
	28	Voltage DC $\pm$ 10 V (-27648 ... 27648)	DC $\pm$ 11.76 V DC 11.76 V = Max. value overdrive range (32511) DC -10 ... 10 V = Rated range (-27648 ... 27648) DC -11.76 V = Min. value underdrive range (-32512) Two's complement	[1]
	29	Voltage DC $\pm$ 4 V (-27648 ... 27648)	DC $\pm$ 4.70 V DC 4.70 V = Max. value overdrive range (32511) DC -4 ... 4 V = Rated range (-27648 ... 27648) DC -4.70 V = Min. value underdrive range (-32511) Two's complement	[1]
	2A	Voltage DC $\pm$ 400 mV (-27648 ... 27648)	DC $\pm$ 470 mV DC 470 mV = Max. value overdrive range (32511) DC -400 ... 470 mV = Rated range (-27648 ... 27648) DC -470 mV = Min. value underdrive range (-32512) Two's complement	[1]
	2B	Voltage DC $\pm$ 10 V (-16384 ... 16384)	DC $\pm$ 12.50 V DC 12.50 V = Max. value overdrive range (20480) DC -10 ... 10 V = Rated range (-16384 ... 16384) DC -12.50 V = Min. value underdrive range (-20480) Value and sign	[1]
	2C	Current DC $\pm$ 20 mA (-27648 ... 27648)	DC $\pm$ 23.52 mA DC 23.52 mA = Max. value overdrive range (32511) DC -20 ... 20 mA = Rated range (-27648 ... 27648) DC -23.52 mA = Min. value underdrive range (-32512) Two's complement	[1]
	2D	Current DC 4 ... 20 mA (0 ... 27648)	DC 1.185 ... 22.81 mA DC 22.81 mA = Max. value overdrive range (32511) DC 4 ... 20 mA = Rated range (0 ... 27648) DC 1.185 mA = Min. value underdrive range (-4864) Two's complement	[1]
	2E	Current DC 4 ... 20 mA (0 ... 16384)	DC 0.8 ... 24 mA DC 24 mA = Max. value overdrive range (20480) DC 4 ... 20 mA = Rated range (0 ... 16384) DC 0.8 mA = Min. value underdrive range (-3277) Value and sign	[1]
	2F	Current DC $\pm$ 20 mA (-16384 ... 16384)	DC $\pm$ 25 mA DC 25 mA = Max. value overdrive range (20480) DC -20 ... 20 mA = Rated range (-16384 ... 16384) DC -25 mA = Min. value underdrive range (-20480) Value and sign	[1]
	32	Resistance measuring 6000 $\Omega$ four-wire	- 6000 $\Omega$ = end value (32767)	[4]
	33	Resistance measuring 6000 $\Omega$ four-wire	- 6000 $\Omega$ = end value (6000)	[4]
	35	Resistance measuring 60 $\Omega$ two-wire	- 60 $\Omega$ = end value (6000)	[3]
	36	Resistance measuring 600 $\Omega$ two-wire	- 600 $\Omega$ = end value (6000)	[3]
	37	Resistance measuring 3000 $\Omega$ two-wire	- 3000 $\Omega$ = end value (30000)	[3]
	38	Resistance measuring 6000 $\Omega$ two-wire	- 6000 $\Omega$ = end value (6000)	[3]



Module parameters	No. hex	Setting range / function	Description / measuring range / representation	Wiring diagram
Mode channel 1 ... 4	3A	Current DC $\pm 20$ mA (-16384 ... 16384)	DC $\pm 25$ mA DC 25 mA = Max. value overdrive range (20480) DC -20 ... 20 mA = Rated range (-16384 ... 16384) DC -25 mA = Min. value underdrive range (-20480) Two's complement	[1]
	3B	Voltage DC $\pm 10$ V (-16384 ... 16384)	DC $\pm 12.50$ V DC 12.50 V = Max. value overdrive range (20480) DC -10 ... 10 V = Rated range (-16384 ... 16384) DC -12.50 V = Min. value underdrive range (-20480) Two's complement	[1]
	3D	Resistance measuring 60 $\Omega$ four-wire	- 60 $\Omega$ = end value (6000)	[4]
	3E	Resistance measuring 600 $\Omega$ four-wire	- 600 $\Omega$ = end value (6000)	[4]
	3F	Resistance measuring 3000 $\Omega$ four-wire	- 3000 $\Omega$ = end value (30000)	[4]
	57	Voltage DC $\pm 50$ mV	DC $\pm 50$ mV DC 58.79 mV = Max. value overdrive range (5879) DC -50 ... 50 mV = Rated range (-5000 ... 5000) DC -58.79 mV = Min. value underdrive range (-5879) Two's complement	[1]
	58	Voltage DC $\pm 10$ V	DC $\pm 11.76$ V DC 11.76 V = Max. value overdrive range (11760) DC -10 ... 10 V = Rated range (-10000 ... 10000) DC -11.76 V = Min. value underdrive range (-11760) Two's complement	[1]
	59	Voltage DC $\pm 4$ V	DC $\pm 4.7$ V DC 4.7 V = Max. value overdrive range (4700) DC -4 ... 4 V = Rated range (-4000 ... 4000) DC -4.7 V = Min. value underdrive range (-4700) Two's complement	[1]
	5A	Voltage DC $\pm 400$ mV	DC $\pm 470$ mV DC 470 mV = Max. value overdrive range (4700) DC -400 ... 400 mV = Rated voltage (-4000 ... 4000) DC -470 mV = Min. value underdrive range (-4700) Two's complement	[1]
	5C	Current DC $\pm 20$ mA	DC $\pm 23.51$ mA DC 23.51 mA = Max. value overdrive range (23510) DC -20 ... 20 mA = Rated range (-20000 ... 20000) DC -23.51 mA = Min. value underdrive range (-23510) Two's complement	[1]
	5D	Current DC 4 ... 20 mA	DC 1.185 ... 22.81 mA DC 22.81 mA = Max. value overdrive range (18810) DC 4 ... 20 mA = Rated range (0 ... 16000) DC 1.185 mA = Min. value underdrive range (-2815) Two's complement	[1]
	62	Cu50 in the 2-wire connection	-50 °C ... 150 °C Unit: 1/10 °C, two's complement	[3]
	6A	Cu50 in the 4-wire connection	-50 °C ... 150 °C Unit: 1/10 °C, two's complement	[4]
	FF	Channel not active (disabled)	-	-
ModeControl channel 1 ... 4			The "ModeControl Channel 1 ... 4" module parameter is used to set the conversion speed as well as averaging and a Hüllfunktion.	-

- 1) The compensation of the neutralization must be implemented externally.
- 2) The compensation of the neutralization must be implemented externally. Connect the thermocouple conductors directly to the front connector. Where necessary, extend them using thermocouple extension cables.



	<b>NOTE</b> The default setting of the OAI43B I/O module is "-10 ... 10 V (-27648 ... 27648)".
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**Module parameter ModeControl Channel 1 ... 4**

The "ModeControl Channel 1 ... 4" module parameter is used to set the following parameters:

- Conversion speed
- Mean value calculation
- Envelope function

*Structure*

Bit 0 ... 7	Resolution
<b>Bit 3 ... 0: Conversion speed per channel<sup>1)</sup></b>	
<ul style="list-style-type: none"> <li>• 0000 = 15 conversions/s</li> <li>• 0001 = 30 conversions/s</li> <li>• 0010 = 60 conversions/s</li> <li>• 0011 = 120 conversions/s</li> <li>• 0100 = 170 conversions/s</li> <li>• 0101 = 200 conversions/s</li> <li>• 0110 = 3.7 conversions/s</li> <li>• 0111 = 7.5 conversions/s</li> </ul>	16 16 15 14 12 10 16 16
<b>Bit 5 ... 4: Mean value calculation</b>	
<ul style="list-style-type: none"> <li>• 00 = disabled</li> <li>• 01 = use 2 of 3 values</li> <li>• 10 = use 4 of 6 values</li> <li>• 11 = disabled</li> </ul>	
<b>Bit 7 ... 6: Envelope function</b>	
<ul style="list-style-type: none"> <li>• 00 = disabled</li> <li>• 01 = envelope ±8</li> <li>• 10 = envelope ±16</li> <li>• 11 = disabled</li> </ul>	

- 1) The values refer to single-channel operation. To calculate the conversion speed per channel for multi-channel operation, divide the specified conversion speeds by the number of active channels.

**Conversion speed**

Use bit 0 ... 3 to set the conversion speed for each input channel. Note that the resolution decreases with higher conversion speeds due to the reduced integration time. The data transmission format remains the same. Only the least significant bits (LSBs) are no longer relevant for the analog value.



*Mean value calculation*

- **Mean value function 2 of 3 values**

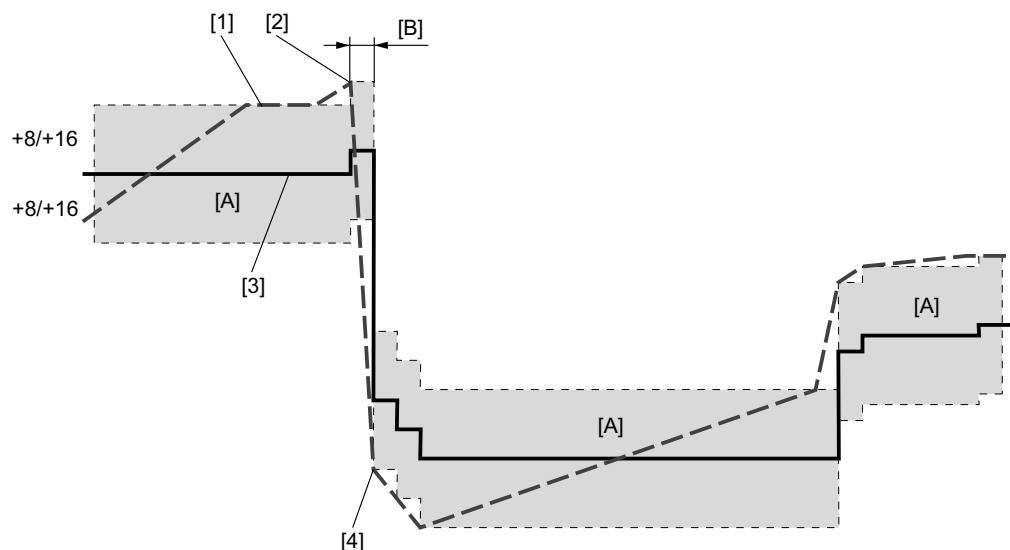
After every measuring, the OAI43B analog input module calculates the mean value of the last 3 values. The value most different from the mean value is discarded. The remaining 2 values are averaged again. This value will then be provided as output value.

- **Mean value function 4 of 6 values**

After every measuring, the OAI43B analog input module calculates the mean value of the last 6 values. The two values most different from the mean value are discarded. The remaining 4 values are averaged again. This value will then be provided as output value.

*Envelope function*

The output value [3] is 'wrapped' with an envelope [A] with a parameterizable value. If the measured value [1, 2, 4] lies over or under the envelope, the envelope [A] migrates accordingly. The output value [3] is always the mean value of the envelope (→ following figure).



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- [1] Measured value within envelope → no envelope shift. The output value is the mean value of the current upper and lower limit of the envelope.
- [2] Measured value exceeds the envelope upwards → envelope shifts up by the difference between "old" upper limit of the envelope and measured value. The output value is the mean value of the "new" upper and lower limits of the envelope.
- [4] Measured value exceeds the envelope downwards → envelope shifts down by the difference between "old" lower limit of the envelope and measured value. The output value is the mean value of the "new" upper and lower limits of the envelope.
- [B] Integration time



## Unit Design and Technical Data of the MOVI-PLC® I/O System

### OAI43B analog input module (multi-input)

#### **Technical data**

<b>Electrical data of OAI43B</b>																
Number of inputs with 4-wire resistance-based sensor	4 2															
Cable length (shielded)	200 m															
<b>Voltages, currents, potentials</b>																
Constant current for resistance-based sensor Galvanic isolation Channel/backplane bus between the channels	1.25 mA Yes No															
Permitted potential difference between inputs ( $U_{CM}$ ) between inputs and $M_{internal}$ ( $U_{iso}$ )	DC 5 V DC 75 V / AC 60 V															
Insulation tested at	DC 500 V															
Current consumption from backplane bus	DC 280 mA															
Power loss of the I/O module	1.4 W															
<b>Analog value generation</b>		<b>Conversion time/resolution (per channel)</b>														
Measuring principle	Sigma delta															
Parameterizable	Yes															
Conversion speed [Hz]	200	170	120	60	30	15	7.5	3.7								
Integration time [ms]	5	6	8	17	33	67	133	270								
Basic conversion time [ms]	7	8	10	19	35	69	135	272								
Additional conversion time for wire break monitoring [ms]	135															
One-time service time per cycle (only with thermocouple) [ms]	10															
Resolution including overdrive range [Bit]	10	12	14	15	16	16	16	16								
Interference voltage suppression for interference frequency f1 [Hz]	No					50 Hz and 60 Hz										
Basic execution time of the I/O module (all channels enabled) [ms]	28	32	40	76	140	276	540	1088								
Mean value calculation	2 of 3 or 4 of 6															
Envelope function	$\pm 8$ or $\pm 16$															
<b>Interference suppression, error limits</b>																
Interference suppression for $f = n \times (f_1 \pm 1\%)$ , ( $f_1$ = interfering frequency; $n = 1, 2, \dots$ )																
Common-mode interference ( $U_{CM} < 5$ V)	> 80 dB															
Opposed-mode interference (peak value of interference < rated value of input range)	> 80 dB															
Interference between inputs	> 50 dB															



<b>Electrical data of OAI43B</b>		
<b>Operational limits (only valid up to 120 W/s) (over entire temperature range, referred to input range)</b>		
	Measuring range	Tolerance
Voltage input	±50 mV ±400 mV, ±4 V, ±10 V	±0.6 % ±0.3 %
Current input	±20 mA 0 ... 20 mA 4 ... 20 mA	±0.3 % ±0.6 % ±0.8 %
Resistance	0 ... 60 Ω 0 ... 600 Ω, 0 ... 3 kΩ, 0 ... 6 kΩ	±0.8 % ±0.4 %
Resistance thermometer	Pt100, Pt1000 Ni100, Ni1000 Cu50	±0.4 % ±1.0 % ±1.4 %
Thermocouple	Type J, K, N, R, S, E, T	± 1.5 %
<b>Basic error limit (operational limit at 25 °C, referred to input)</b>		
Voltage input	±50 mV ±400 mV, ±4 V, ±10 V	±0.4 % ±0.2 %
Current input	±20 mA 0 ... 20 mA 4 ... 20 mA	±0.2 % ±0.4 % ±0.5 %
Resistance	0 ... 60 Ω 0 ... 600 Ω, 0 ... 3 kΩ, 0 ... 6 kΩ	±0.4 % ±0.2 %
Resistance thermometer	Pt100, Pt1000 Ni100, Ni1000 Cu50	±0.2 % ±0.5 % ±0.7%
Thermocouple	Type J, K, N, R, S, E, T	±1.0 %
Temperature error during current measuring (referred to input range)		±0.005 %/K
Linearity error (referred to input range)		±0.015 %/K
Repeatability (under steady-state conditions, at 25 °C, referred to input range)		±0.05 %
Temperature error of internal compensation		±1.5 %
<b>Status, interrupts, diagnostics</b>		
Diagnostics interrupt	Parameterizable	
Diagnostic functions Fault display for group fault Diagnostic information can be read out	Red 'SF' LED (per channel) Possible	
<b>Encoder selection data</b>		
Voltage HH±50 mV, ±400 mV, ±4 V, ±10 V	20 MΩ	
Current HH±20 mA, 0 ... 20 mA, 4 ... 20 mA	50 Ω	
Resistance 0 ... 60 Ω, 0 ... 600 Ω, 0 ... 3 kΩ, 0 ... 6 kΩ	20 MΩ	
Resistance thermometer Pt100, Pt1000, Ni100, Ni1000, Cu50	20 MΩ	
Thermocouple Type J, K, N, R, S, E, T	20 MΩ	
Permitted input voltage for voltage input (destruction limit)	DC 25 V	



## Unit Design and Technical Data of the MOVI-PLC® I/O System

### OAI43B analog input module (multi-input)

<b>Electrical data of OAI43B</b>	
Signal encoder connection	Possible
Voltage measurement	
Current measurement	
as 2-wire transducer	Possible, with external supply
as 4-wire transducer	Possible
Resistance measurement	
with 2-wire connection	Possible
with 4-wire connection	Possible
Linearization of characteristic curves	
Parameterizable	
for resistance thermometer	Yes
Thermocouples	Pt100, Pt1000, Ni100, Ni1000, Cu50 Type J, K, N, R, S, E, T
Temperature compensation	
Parameterizable	
Internal temperature compensation	Yes
External temperature compensation	Possible
with comparison table (0 °C)	Possible
Unit for temperature measurement	°C
<b>Programming data</b>	
Input data	8 bytes (1 word per channel)
<b>Dimensions and weight</b>	
Dimensions (W ×H ×D) [mm]	25.4 × 76 × 88
Weight	80 g

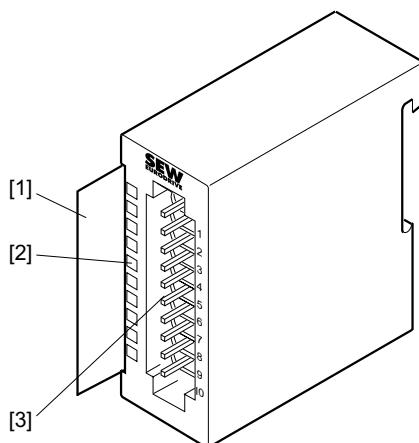


#### **4.8 OAO41B analog output module (voltage)**

**Part number** 1821 487 8

**Description** The OAO41B analog output module has 4 outputs. Their functions can be configured individually. The OAO41B analog output module requires a total of 8 bytes of the process image for the output data (2 bytes per channel). The channels on the OAO41B output module are galvanically isolated from the backplane bus and power supply voltage by means of DC/DC converters and optocouplers. The OAO41B analog output module must be supplied with external DC 24 V.

- 4 analog outputs with common ground
- The different channels can be configured individually.
- Suitable for actuators with inputs  $\pm 10$  V or 0 ... 10 V
- LED status indicator



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- [1] Label for the bit address with description
- [2] LED status indicator
- [3] Connector strip



## Unit Design and Technical Data of the MOVI-PLC® I/O System

### OAO41B analog output module (voltage)

#### Connector assignment

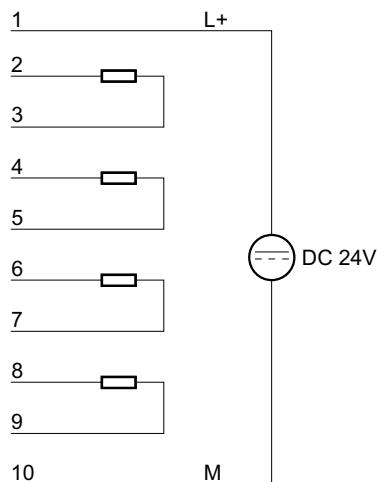
OAO41B		Terminal/LED	Assignment/description
		1	Power supply voltage DC 24 V
		2	Positive connection channel 0
		3	Ground channel 0
		4	Positive connection channel 1
		5	Ground channel 1
		6	Positive connection channel 2
		7	Ground channel 2
		8	Positive connection channel 3
		9	Ground channel 3
		10	Ground DC 24 V
		LED +	Green: DC 24 V present

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#### LED L+

The L+ LED lights up green if the supply voltage DC 24 V is present.

#### Wiring diagram



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**Function assignment**

You set the functions in the PLC configuration in the PLC Editor in the module parameters of the I/O module (→ section "Parameter setting of I/O modules"). Default settings are printed in bold.

Module parameters	Setting range	Description/measuring range/representation
Event time	0 ... <b>10</b> ... 500 ms	The "Event time" is used to set the transmission rate for cyclic data transmission between MOVI-PLC® and MOVI-PLC® I/O system.
Mode channel 1 ... 4	<b>-10 ... 10 V</b> <b>(-27648 ... 27648)</b>	DC ±11.76 V DC 11.76 V = Max. value overdrive range (32511) DC -10 V ... 10 V = Rated range (-27648 ... 27648) DC -11.76 V = Min. value underdrive range (-32512) Two's complement
	0 ... 10 V (0 ... 27648)	DC 0 ... 11.76 V DC 11.76 V = Max. value overdrive range (32511) DC 0 V ... 10 V = Rated range (0 ... 27648) No underdrive range Two's complement
	<b>-10 V ... 10 V</b> <b>(-16384 ... 16384)</b>	DC ±12.5 V DC 12.5 V = Max. value overdrive range (20480) DC -10 V ... 10 V = Rated range (-16384 ... 16384) DC -12.5 V = Min. value underdrive range (-20480) Two's complement
	0 ... 10 V (0 ... 16384)	DC 0 ... 12.5 V DC 12.5 V = Max. value overdrive range (20480) DC 0 V ... 10 V = Rated range (0 ... 16384) No underdrive range Two's complement
	Not active	-



**NOTE**

- The default setting of the OAO41B O/I module is "-10 ... 10 V (-27648 ... 27648)".
- Value "0" is output in all modes when the overdrive range or underdrive range is exceeded.



## Unit Design and Technical Data of the MOVI-PLC® I/O System

### OAO41B analog output module (voltage)

#### **Technical data**

<b>Electrical data of OAO41B</b>	
Number of output channels	4
Cable length (shielded)	200 m
Supply voltage Polarity reversal protection	DC 24 V Yes
Galvanic isolation between channel/backplane bus between channel/supply voltage between the channels between channel/load voltage L+	Yes Yes No Yes
Permitted potential difference between inputs and M <sub>internal</sub> (U <sub>iso</sub> )	DC 75 V / AC 60 V
Insulation tested at	DC 500 V
Current consumption from backplane bus from load voltage L+ (without load)	DC 60 mA DC 100 mA
Power loss of the I/O module	2.7 W
<b>Analog value generation output channels</b>	
Resolution ±10 V 0 ... 10 V	11 bit + sign 11 bit
Cycle time (all channels)	700 µs
Setting time Resistive load Capacitive load Inductive load	1.5 ms 3 ms -
<b>Interference suppression, error limits</b>	
Interference between outputs	> 40 dB
Basic error limit (over entire temperature range, referred to output range) Voltage output	Measuring range ±10 V / tolerance ±0.2 % Measuring range 0 ... 10 V / tolerance ±0.4 %
Basic error limit (operational limit at 25 °C, referred to output range) Voltage output	Measuring range ±10 V / tolerance ±0.1 % Measuring range 0 ... 10 V / tolerance ±0.2 %
Temperature error (referred to output range)	±0.01 %/K
Linearity error (referred to output range)	±0.05 %
Repeatability (under steady-state conditions at 25 °C, referred to output range)	±0.05 %
Output ripple Bandwidth 0 to 50 kHz (referred to output range)	±0.05 %
<b>Actuator selection data</b>	
Voltage	Output ranges: ±10 V / 0 ... 10 V
Load impedance (in the rated range of the output) for voltage outputs Capacitive load	Min. 5 kΩ Max. 1 µF
Voltage output Short-circuit proof Short-circuit current	Yes Max. 6 mA
Destruction limit against externally applied voltages/currents Voltage at the output against M <sub>ANA</sub> Current	Max. 15 V Max. 30 mA



<b>Electrical data of OAO41B</b>	
Connection of the actuators Voltage output	2-wire connection
<b>Status, interrupts, diagnostics</b>	
Diagnostics interrupt	-
Diagnostic functions	-
Fault display for group fault	-
Diagnostic information can be read out	-
Substitute values can be switched in	-
<b>Programming data</b>	
Input data	-
Output data	8 bytes (1 word per channel)
Diagnostic data	-
<b>Dimensions and weight</b>	
Dimensions (W ×H ×D) [mm]	25.4 × 76 × 88
Weight	100 g

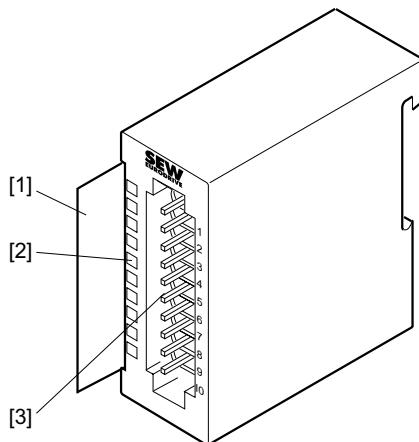


#### 4.9 OAO42B analog output module (current)

**Part number** 1821 488 6

**Description** The OAO42B analog output module has 4 outputs. Their functions can be configured individually. The OAO42B output module requires a total of 8 bytes of the process image for the output data (2 bytes per channel). The channels on the OAO42B output module are galvanically isolated from the backplane bus by means of DC/DC converters and optocouplers. The OAO42B analog output module must be supplied with external DC 24 V.

- 4 analog outputs with common ground
- The outputs can be configured individually.
- Suitable for actuators with inputs 0 ... 20 mA or 4 ... 20 mA



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- [1] Label for the bit address with description
- [2] LED status indicator
- [3] Connector strip



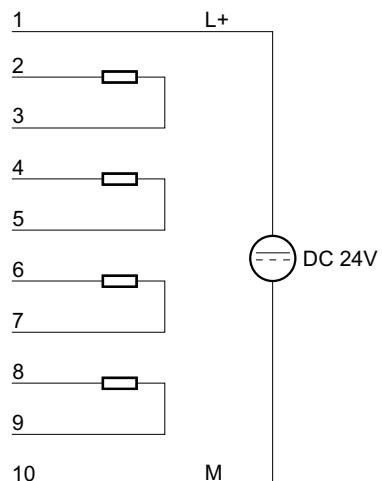
**Connector assignment**

OAO42B	Terminal/LED	Assignment/description
	1	Power supply voltage DC 24 V
	2	Positive connection channel 0
	3	Ground channel 0
	4	Positive connection channel 1
	5	Ground channel 1
	6	Positive connection channel 2
	7	Ground channel 2
	8	Positive connection channel 3
	9	Ground channel 3
	10	Ground DC 24 V
	LED +	Green: DC 24 V present

**LED L+**

The L+ LED lights up green if the supply voltage DC 24 V is present.

**Wiring diagram**



62060AXX



## Unit Design and Technical Data of the MOVI-PLC® I/O System

### OAO42B analog output module (current)

#### Function assignment

You set the functions in the PLC configuration in the PLC Editor in the module parameters of the I/O module (→ section "Parameter setting of I/O modules"). Default settings are printed in bold.

Module parameters	Setting range	Description/measuring range/representation
Event time	0 ... <b>10</b> ... 500 ms	The "Event time" is used to set the transmission rate for cyclic data transmission between MOVI-PLC® and MOVI-PLC® I/O system.
Mode channel 1 ... 4	4 ... 20 mA (0 ... 27648)	DC 0 ... 22.81 mA DC 22.81 mA = Max. value overdrive range (32511) DC 4 ... 20 mA = Rated range (0 ... 27648) DC 0 mA = Min. value underdrive range (-6912) Two's complement
	0 ... 20 mA (0 ... 27648)	DC 0 ... 23.52 mA DC 23.52 mA = Max. value overdrive range (32511) DC 0 ... 20 mA = Rated range (0 ... 27648) No underdrive range Two's complement
	4 ... 20 mA (0 ... 16384)	DC 0 ... 24 mA DC 24 mA = Max. value overdrive range (20480) DC 4 ... 20 mA = Rated range (0 ... 16384) DC 0 mA = Min. value underdrive range (-4096) Two's complement
	0 ... 20 mA (0 ... 16384)	DC0 ... 24 mA DC 24 mA = Max. value overdrive range (20480) DC 4 ... 20 mA = Rated range (0 ... 16384) No underdrive range Two's complement
	Not active	-



#### NOTE

- The default setting of the OAO42B I/O module is "4 ... 20 mA (0 ... 27648)".
- The value "0" is output in all modes when the overdrive range or underdrive range is exceeded.

#### Technical data

Electrical data of OAO42B	
Number of output channels	4
Cable length (shielded)	200 m
Supply voltage Polarity reversal protection	DC 24 V Yes
Galvanic isolation between channel/backplane bus between channel/supply voltage between the channels between channel/load voltage L+	Yes Yes No Yes
Permitted potential difference between inputs and M <sub>internal</sub> (U <sub>iso</sub> )	DC 75 V / AC 60 V
Insulation tested at	DC 500 V
Current consumption from backplane bus from load voltage L+ (without load)	DC 60 mA DC 50 mA
Power loss of the I/O module	1.5 W



<b>Electrical data of OAO42B</b>	
<b>Analog value generation output channels</b>	
Resolution 0 ... 20 mA 4 ... 20 mA	12 bit 11 bit
Cycle time (all channels)	700 µs
Setting time Resistive load Capacitive load Inductive load	0.03 ms - 1.5 ms
<b>Interference suppression, error limits</b>	
Interference between outputs	> 40 dB
Basic error limit (over entire temperature range, referred to output range) Current output	Measuring range 0 ... 20 mA / tolerance ±0.4 % Measuring range 4 ... 20 mA / tolerance ±0.5 %
Basic error limit (operational limit at 25 °C, referred to output range) Current output	Measuring range 0 ... 20 mA / tolerance ±0.2 % Measuring range 4 ... 20 mA / tolerance ±0.3 %
Temperature error (referred to output range)	±0.01 %/K
Linearity error (referred to output range)	±0.05 %
Repeatability (under steady-state conditions at 25 °C, referred to output range)	±0.05 %
Output ripple Bandwidth 0 to 50 kHz (referred to output range)	±0.05 %
<b>Actuator selection data</b>	
Current	Output ranges: 0 ... 20 mA / 4 ... 20 mA
Load impedance (in the rated range of the output) for current outputs Inductive load	Min. 350 Ω Max. 10 mH
Current output No-load voltage	DC 12 V
Destruction limit against externally applied voltages/currents Voltage at the output against M <sub>ANA</sub> Current	Max. 12 V Max. 30 mA
Connection of the actuators Current output	2-wire connection
<b>Status, interrupts, diagnostics</b>	
Diagnostics interrupt	-
Diagnostic functions	-
Fault display for group fault	-
Diagnostic information can be read out	-
Substitute values can be switched in	-
<b>Programming data</b>	
Input data	-
Output data	8 bytes (1 word per channel)
<b>Dimensions and weight</b>	
Dimensions (W xH xD) [mm]	25.4 x 76 x 88
Weight	100 g

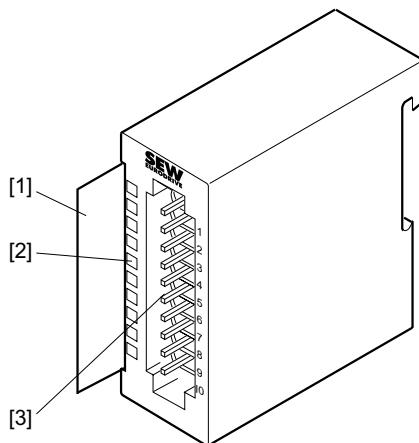


#### 4.10 OAO43B analog output module (multi-output)

**Part number** 1821 489 4

**Description** The OAO43B analog output module has 4 outputs. Their functions can be configured individually. The OAO43B output module requires a total of 8 bytes of the process image for the output data (2 bytes per channel). The values must be specified left-justified in the two's complement. The channels on the OAO42B output module are galvanically isolated from the backplane bus by means of DC/DC converters.

- The outputs can be configured individually.
- Four outputs with common ground
- Suitable for actuators with inputs  $\pm 10$  V, 1 ... 5 V, 0 ... 10 V,  $\pm 20$  mA, 4 ... 20 mA or 0 ... 20 mA
- Diagnostic LED and diagnostic function



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- [1] Label for the bit address with description
- [2] LED status indicator
- [3] Connector strip



**Connector assignment**

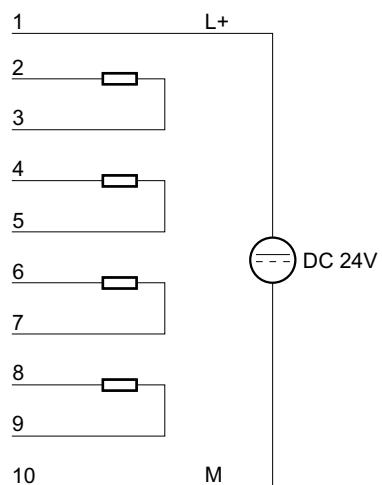
OAO43B	Terminal/LED	Assignment/description
	1	Power supply voltage DC 24 V
	2	Positive connection channel 0
	3	Ground channel 0
	4	Positive connection channel 1
	5	Ground channel 1
	6	Positive connection channel 2
	7	Ground channel 2
	8	Positive connection channel 3
	9	Ground channel 3
	10	Ground DC 24 V
	'SF' LED	Lights up red if <ul style="list-style-type: none"> <li>the OAO43B output module is not supplied with voltage</li> <li>a short-circuit occurs in the voltage output</li> <li>a wire break occurs in the current output</li> <li>the module contains an incorrect parameter</li> </ul>
		62058AXX

**'SF' LED**

The 'SF' LED lights up red if

- the OAO43B output module is not supplied with voltage
- a short-circuit occurs in the voltage output
- a wire break occurs in the current output
- a parameter in the module was set incorrectly

**Wiring diagram**



62060AXX



## Unit Design and Technical Data of the MOVI-PLC® I/O System

### OAO43B analog output module (multi-output)

#### **Function assignment**

A function number is assigned to a channel by setting the module parameters (→ section "Parameter setting of I/O modules"). The function number 00<sub>hex</sub> means the function number stored permanently in the parameter setting data is not influenced.

You can disable a channel by specifying FF<sub>hex</sub>.

Module parameters	No. hex	Function	Description/measuring range/representation
Event time	-	0 ... 10 ... 500 ms	The "Event time" is used to set the transmission rate for cyclic data transmission between MOVI-PLC® and MOVI-PLC® I/O system.
Module mode	-	-	<p>The "Module mode" module parameter is used to set whether the OAO43B analog output module is to generate a diagnostics interrupt or not. In this case, the diagnostic information will be output at the MPLC_ConnectSEW-IOSystem_CAN function module (→ section "IEC program"). You find more information in the "MPLCUtilities Library for MOVI-PLC®" manual.</p> <p>Bit 0 ... 5, 7 : Reserved      Bit 6:</p> <ul style="list-style-type: none"> <li>• 0 = Diagnostic interrupt disabled</li> <li>• 1 = Diagnostic interrupt enabled</li> </ul>



Module parameters	No. hex	Function	Description/measuring range/representation
Mode channel 1 ... 4	01	Voltage $\pm 10$ V ( $-16384 \dots 16384$ ) (two's complement)	DC $\pm 12.5$ V DC $12.5$ V = Max. value overdrive range (20480) DC $-10 \dots 10$ V = Rated range ( $-16384 \dots 16384$ ) DC $-12.5$ V = Min. value underdrive range (-20480)
	02	Voltage $1 \dots 5$ V ( $0 \dots 16384$ ) (two's complement)	DC $0 \dots 6$ V DC $6$ V = Max. value overdrive range (20480) DC $1 \dots 5$ V = Rated range ( $0 \dots 16384$ ) DC $0$ V = Min. value underdrive range (-4096)
	05	Voltage $0 \dots 10$ V ( $0 \dots 16384$ ) (two's complement)	DC $0 \dots 12.5$ V DC $12.5$ V = Max. value overdrive range (20480) DC $0 \dots 10$ V = Rated range ( $0 \dots 16384$ ) No underdrive range
	09	Voltage $\pm 10$ V ( $-27648 \dots 27648$ ) (two's complement)	DC $\pm 11.76$ V DC $11.76$ V = Max. value overdrive range (32511) DC $-10 \dots 10$ V = Rated range ( $-27648 \dots 27648$ ) DC $-11.76$ V = Min. value underdrive range (-32512)
	0A	Voltage $1 \dots 5$ V ( $0 \dots 27648$ ) (two's complement)	DC $0 \dots 5.704$ V DC $5.704$ V = Max. value overdrive range (32511) DC $1 \dots 5$ V = Rated range ( $0 \dots 27648$ ) DC $0$ V = Min. value underdrive range (-6912)
	0D	Voltage $0 \dots 10$ V ( $0 \dots 27648$ ) (two's complement)	DC $0 \dots 11.76$ V DC $11.76$ V = Max. value overdrive range (32511) DC $0 \dots 10$ V = Rated range ( $0 \dots 27648$ ) No underdrive range
	03	Current $\pm 20$ mA ( $-16384 \dots 16384$ ) (two's complement)	DC $\pm 25$ mA DC $25$ mA = Max. value overdrive range (20480) DC $-20 \dots 20$ mA = Rated range ( $-16384 \dots 16384$ ) DC $25$ mA = Min. value underdrive range (-20480)
	04	Current $4 \dots 20$ mA ( $0 \dots 16384$ ) (two's complement)	DC $0 \dots 24$ mA DC $24$ mA = Max. value overdrive range (20480) DC $4 \dots 20$ mA = Rated range ( $0 \dots 16384$ ) DC $0$ mA = No underdrive range (-4096)
	06	Current $0 \dots 20$ mA ( $0 \dots 16384$ ) (two's complement)	DC $0 \dots 25$ mA DC $25$ mA = Max. value overdrive range (20480) DC $0 \dots 20$ mA = Rated range ( $0 \dots 16384$ ) No underdrive range
	0B	Current $\pm 20$ mA ( $-27648 \dots 27648$ ) (two's complement)	DC $\pm 23.52$ mA DC $23.52$ mA = Max. value overdrive range (32511) DC $-20 \dots 20$ mA = Rated range ( $-27648 \dots 27648$ ) DC $-23.52$ mA = Min. value underdrive range (-32512)
	0C	Current $4 \dots 20$ mA ( $0 \dots 27648$ ) (two's complement)	DC $0 \dots 22.81$ mA DC $22.81$ mA = Max. value overdrive range (32511) DC $4 \dots 20$ mA = Rated range ( $0 \dots 27648$ ) DC $0$ mA = Min. value underdrive range (-6912)
	0E	Current $0 \dots 20$ mA ( $0 \dots 27648$ ) (two's complement)	DC $0 \dots 23.52$ mA DC $23.52$ mA = Max. value overdrive range (32511) DC $0 \dots 20$ mA = Rated range ( $0 \dots 27648$ ) No underdrive range
	FF	Channel not active (disabled)	

NOTES	
<b>i</b>	<ul style="list-style-type: none"> <li>The default setting of the OAI43B I/O module is "<math>-10 \dots 10</math> V (<math>-27648 \dots 27648</math>)".</li> <li>The value "0" is output in all modes when the overdrive range or underdrive range is exceeded.</li> </ul>



## Unit Design and Technical Data of the MOVI-PLC® I/O System

### OAO43B analog output module (multi-output)

#### **Technical data**

<b>Electrical data of OAO43B</b>	
Number of output channels	4
Cable length (shielded)	200 m
Supply voltage Polarity reversal protection	DC 24 V Yes
Galvanic isolation between channel/backplane bus between channel/supply voltage between the channels between channel/load voltage L+	Yes Yes No Yes
Insulation tested at	DC 500 V
Current consumption from backplane bus from load voltage L+ (without load)	DC 75 mA DC 60 mA
Power loss of the I/O module	1.8 W
<b>Analog value generation output channels</b>	
Resolution (incl. overdrive range) ±10 V, ±20 mA 4 ... 20 mA, 1 ... 5 V 0 ... 10 V, 0 ... 20 mA	11 bit + sign 10 bit 11 bit
Cycle time (all channels)	700 µs
Conversion time (per channel)	450 µs
Setting time Resistive load Capacitive load Inductive load	0.05 ms 0.5 ms 0.1 ms
<b>Interference suppression, error limits</b>	
Interference between outputs	> 40 dB
Operational limits (over entire temperature range, referred to output range)	
Voltage output	Measuring range 1 ... 5 V / tolerance 0.8 % <sup>1)</sup> Measuring range 0 ... 10 V / tolerance 0.6 % <sup>1)</sup> Measuring range ±10 V / tolerance 0.4 % <sup>1)</sup>
Current output	Measuring range 4 ... 20 mA / tolerance ±0.8 % <sup>2)</sup> Measuring range 0 ... 20 mA / tolerance ±0.6 % <sup>2)</sup> Measuring range ±20 mA / tolerance ±0.3 % <sup>2)</sup>
Basic error limit (operational limit at 25 °C, referred to output range)	
Voltage output	Measuring range 1 ... 5 V / tolerance 0.4 % <sup>1)</sup> Measuring range 0 ... 10 V / tolerance 0.3 % <sup>1)</sup> Measuring range ±10 V / tolerance 0.2 % <sup>1)</sup>
Current output	Measuring range 4 ... 20 mA / tolerance ±0.5 % <sup>2)</sup> Measuring range 0 ... 20 mA / tolerance ±0.4 % <sup>2)</sup> Measuring range ±20 mA / tolerance ±0.2 % <sup>2)</sup>
Temperature error (referred to output range)	±0.01 %/K
Linearity error (referred to output range)	±0.05 %
Repeatability (under steady-state conditions at 25 °C, referred to output range)	±0.05 %
Output ripple Bandwidth 0 to 50 kHz (referred to output range)	±0.05 %
<b>Actuator selection data</b>	
Output ranges (rated values)	
Voltage	1 ... 5 V, 0 ... 10 V, ±10 V
Current	4 ... 20 mA, 0 ... 20 mA, ±20 mA



<b>Electrical data of OAO43B</b>	
Load impedance (in the rated range of the output)	
for voltage outputs	Min. 1 kΩ
Capacitive load	Max. 1 µF
for current outputs	Max. 500Ω
Inductive load	Max. 10 mH
Voltage output	Yes
Short-circuit proof	Max. 31 mA
Short-circuit current	
Current output	Max. DC 13 V
No-load voltage	
Destruction limit against externally applied voltages/currents	
Voltage at the output against M <sub>ANA</sub>	Max. 15 V
Current	Max. 30 mA
Connection of the actuators	
Voltage output	2-wire connection
Current output	2-wire connection
<b>Status, interrupts, diagnostics</b>	
Diagnostics interrupt	Parameterizable
Diagnostic functions	Parameterizable
Fault display for group fault	'SF' LED
Diagnostic information can be read out	Possible
Substitute values can be switched in	No
<b>Programming data</b>	
Input data	-
Output data	8 bytes (1 word per channel)
<b>Dimensions and weight</b>	
Dimensions (W × H × D) [mm]	25.4 × 76 × 88
Weight	100 g

- 1) The error limits were determined with a load  $R = 1 \text{ G}\Omega$ . When voltage is output, the output resistance of the I/O module is  $30 \Omega$ .
- 2) The error limits were determined with a load  $R = 10 \Omega$ .



## 5 Project Planning with MOVITOOLS® MotionStudio

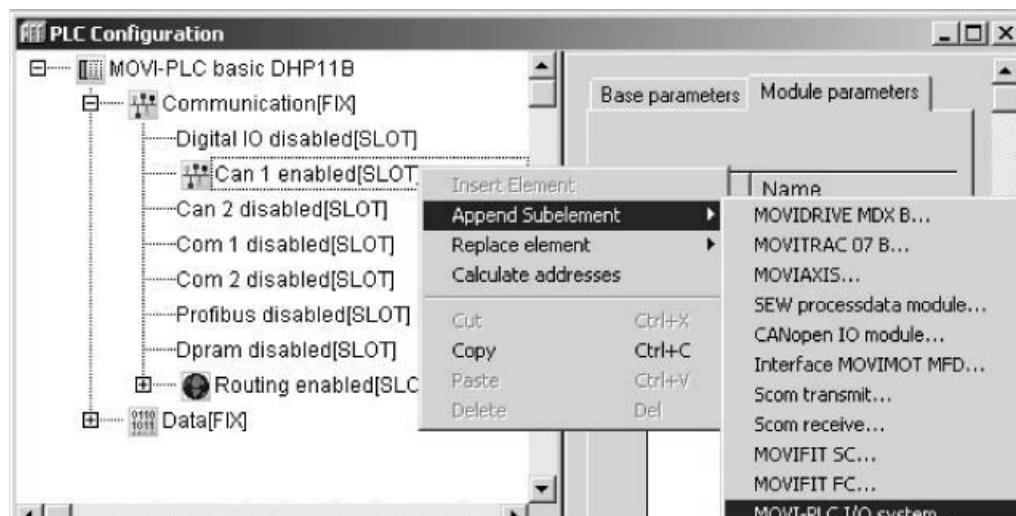
This chapter describes the project planning for the MOVI-PLC® I/O system with the MOVITOOLS® MotionStudio.

### 5.1 PLC Editor project planning tool

- Start MOVITOOLS® MotionStudio and the PLC Editor.
- You find more detailed information in the "Project Planning with MOVITOOLS® MotionStudio" section in the manuals "MOVI-PLC® basic controller DHP11B" and "MOVI-PLC® advanced controller DH.41B"
- For basic information on the PLC Editor and PLC configuration, refer to the "MOVI-PLC® Programming in the PLC Editor" system manual.

### 5.2 Adding a MOVI-PLC® I/O system

- In the PLC configuration, activate the interface to be used for connecting the OCC11B CAN bus coupler of the MOVI-PLC® I/O system to the MOVI-PLC® controller. Replace the relevant entry with "... enabled" (e.g. "CAN 1 enabled" → following figure)  
The baud rate set in the module parameters of the interface must correspond with the baud rate set on the OCC1B CAN bus coupler (→ section "OCC11B CAN bus coupler").
- Select the required entry (e.g. "CAN 1 enabled") and choose the menu items [Append Subelement] / [MOVI-PLC I/O system] from the context menu (→ following figure).
- In the module parameters of the MOVI-PLC® I/O system, set the same bus address that was set at the CAN bus coupler of the MOVI-PLC® I/O system (→ section "OCC11B CAN bus coupler").

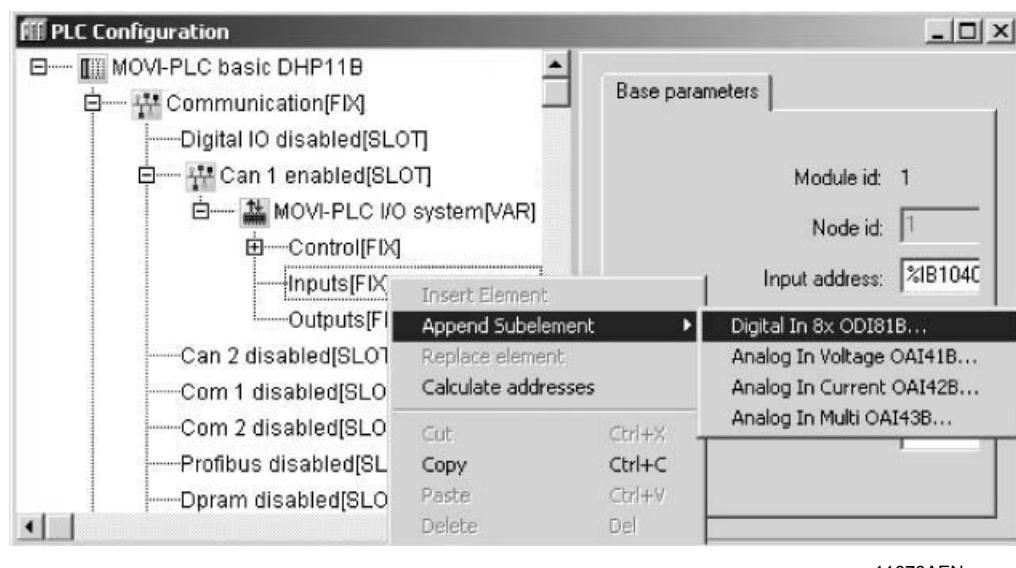


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### 5.3 Configuring I/O modules

- In the PLC configuration (→ following figure), the entries "Inputs" and "Outputs" appear underneath the MOVI-PLC® I/O system. Add the I/O modules of your MOVI-PLC® I/O system to these entries. To do so, choose the required module designations from the context menu.
- Choosing an "Analog ... OA.." analog module will add the relevant module. Choosing the entry "Digital ... 8x OD.." will guide you in one step to the configuration of 8 digital modules even if less than 8 modules are installed.



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In the event of multiple configuration of I/O modules of the same type, the sequence displayed in the PLC configuration window will correspond with the physical sequence in the MOVI-PLC® I/O system from left to right. However, the physical arrangement and combination of various I/O module types need not be reflected in the PLC configuration. Terminal modules are not displayed in the PLC configuration.

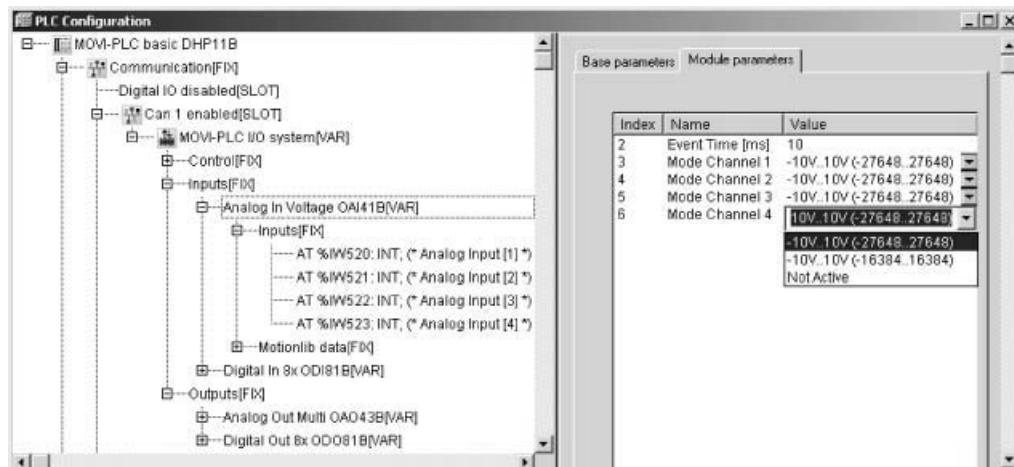
Example: The physical arrangement of the MOVI-PLC® I/O system consists of three ODI81B digital input modules followed by one ODO81B digital output module and five ODI81B digital input modules. However, the PLC configuration still displays all 8 digital input modules in the "Digital IN 8x ODI81B.." entry.

	<b>NOTES</b>
	<p>• The following scaling applies in conjunction with a MOVI-PLC® <i>basic</i> DHP11B controller:</p> <ul style="list-style-type: none"> <li>– You can arrange a maximum of one analog input module and one analog output module each to the bus coupler per MOVI-PLC® I/O system.</li> <li>– Additionally, you can install a maximum number of 8 digital input modules and 8 digital output modules and terminal modules.</li> </ul> <p>Configurations other than this scaling (e.g. two entries "Digital 8x ODI81B..") are not supported physically.</p> <p>• Please also refer to the information in the "Backplane bus" and "step-by-step installation of the I/O system" section in the "Mechanical Installation" chapter.</p>



#### 5.4 Configuring I/O modules

In the module parameters of the I/O modules (→ following figure), set the required functionality according to the module descriptions (→ section "Unit design and technical data of I/O modules").



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#### 5.5 IEC program

- In the library manager, add the MPLCUtilities library to your project. Have the MPLC\_ConnectSEWIOSystem\_CAN function module execute an instance in a cyclic task per MOVI-PLC® I/O system.
- The process image of the relevant I/O system is refreshed while the function module is being executed.



#### NOTE

For a detailed description of the MPLC\_ConnectSEWIOSystem\_CAN function module and the output diagnostic information, refer to the "MPLCUtilities Library for MOVI-PLC®" manual.



## 6 Appendix

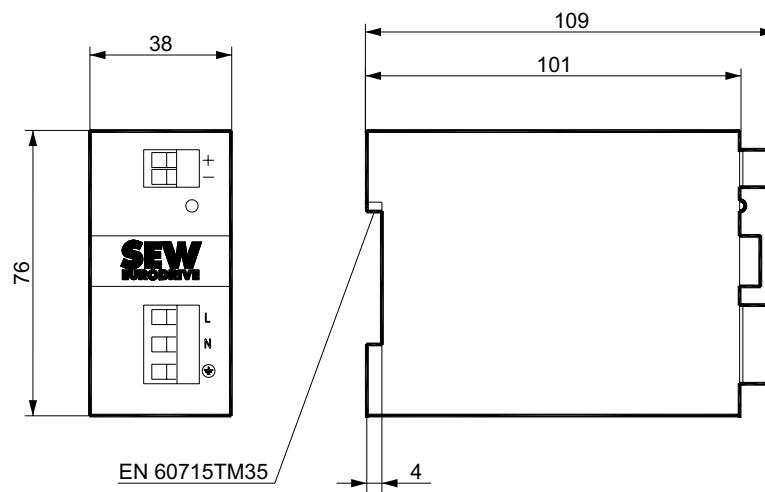
### 6.1 UWU52A switched-mode power supply

#### Technical data

Switched-mode power supply	UWU52A
Part number	188 181 7
Input voltage	AC 1 × 110 ... 240 V
Voltage range	AC 95 ... 265 V, AC 110 ... 300 V
Frequency	50/60 Hz
Max. no-load current	AC 40 mA
Rated input current at AC 1 × 110 V at AC 1 × 230 V	1.04 AAC AC 0.63 A
Output voltage	DC 24 V (-1% / +3%)
Rated output current at 40 °C at 55 °C	DC 2.5 A DC 2.0 A
Residual ripple	< 50 mV <sub>eff</sub>
Interference voltage	< 120 mV <sub>SS</sub>
Power loss	< 5.5 W
Weight	0.23 kg
Operating temperature	0 ... +55 °C (condensation not permitted)
Degree of protection	IP20 (EN 60529)
Protection class	I
Connection	Screw terminals for cable cross sections 0.20 ... 2.5 mm <sup>2</sup>

The power supply is short-circuit proof and protected against overload. Input and output are galvanically isolated.

#### Dimension drawing



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Leave a clearance of at least 50mm at top and bottom of venting slots!



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## Address List

### Address List

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<b>Sales</b>	<b>Bratislava</b>	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-83554 Bratislava	Tel. +421 2 49595201 Fax +421 2 49595200 <a href="mailto:sew@sew-eurodrive.sk">sew@sew-eurodrive.sk</a> <a href="http://sk.sew-eurodrive.com">http://sk.sew-eurodrive.com</a>	
	<b>Žilina</b>	SEW-Eurodrive SK s.r.o. ul. Vojtecha Spanyola 33 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 <a href="mailto:sew@sew-eurodrive.sk">sew@sew-eurodrive.sk</a>	
	<b>Banská Bystrica</b>	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-97411 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 <a href="mailto:sew@sew-eurodrive.sk">sew@sew-eurodrive.sk</a>	
<b>Slovenia</b>				
<b>Sales Service</b>	<b>Celje</b>	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 <a href="mailto:pakman@siol.net">pakman@siol.net</a>	

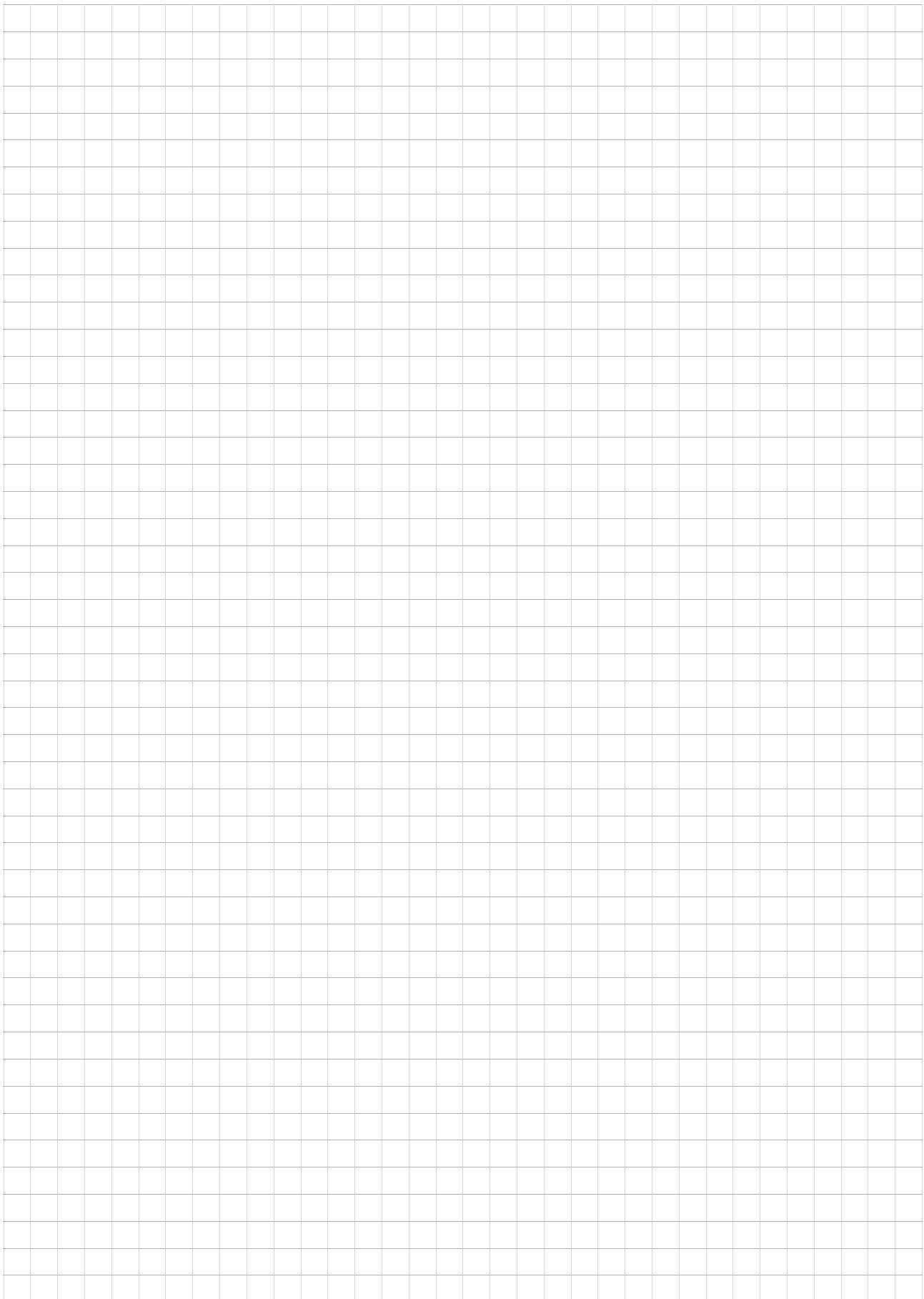


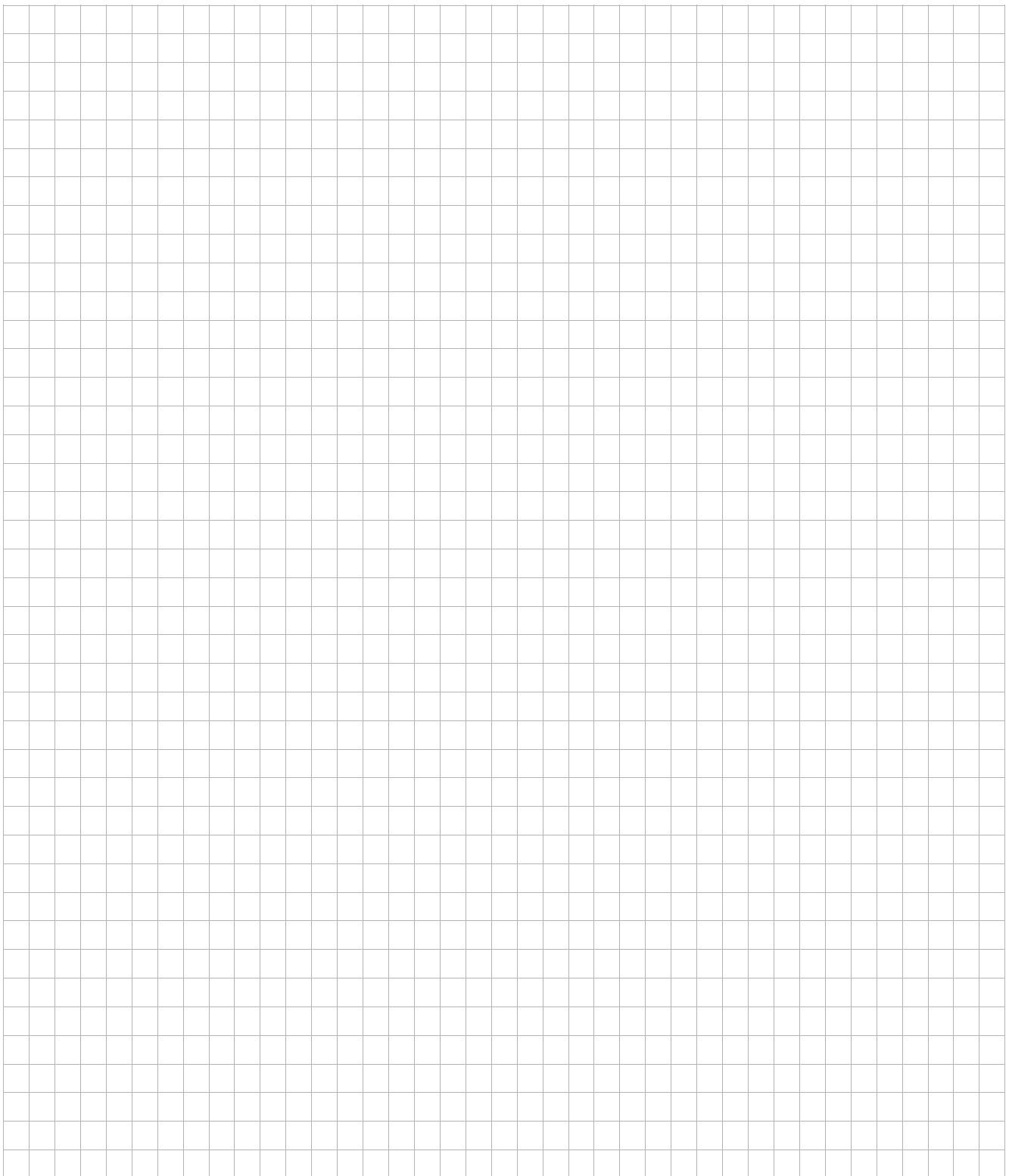
## Address List

South Africa			
<b>Assembly Sales Service</b>	<b>Johannesburg</b>	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 11 494-3104 <a href="http://www.sew.co.za">http://www.sew.co.za</a> <a href="mailto:dross@sew.co.za">dross@sew.co.za</a>
	<b>Capetown</b>	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 <a href="mailto:dswanepoel@sew.co.za">dswanepoel@sew.co.za</a>
	<b>Durban</b>	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 <a href="mailto:dtait@sew.co.za">dtait@sew.co.za</a>
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<b>Assembly Sales Service</b>	<b>Bilbao</b>	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 <a href="http://www.sew-eurodrive.es">http://www.sew-eurodrive.es</a> <a href="mailto:sew.spain@sew-eurodrive.es">sew.spain@sew-eurodrive.es</a>
Sweden			
<b>Assembly Sales Service</b>	<b>Jönköping</b>	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442-00 Fax +46 36 3442-80 <a href="http://www.sew-eurodrive.se">http://www.sew-eurodrive.se</a> <a href="mailto:info@sew-eurodrive.se">info@sew-eurodrive.se</a>
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<b>Assembly Sales Service</b>	<b>Chonburi</b>	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuarooh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 <a href="mailto:sewthailand@sew-eurodrive.com">sewthailand@sew-eurodrive.com</a>
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<b>Sales</b>	<b>Tunis</b>	T. M.S. Technic Marketing Service 5, Rue El Houdaibiah 1000 Tunis	Tel. +216 71 4340-64 + 71 4320-29 Fax +216 71 4329-76 <a href="mailto:tms@tms.com.tn">tms@tms.com.tn</a>
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<b>Assembly Sales Service</b>	<b>Istanbul</b>	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 / 164 3838014/15 Fax +90 216 3055867 <a href="http://www.sew-eurodrive.com.tr">http://www.sew-eurodrive.com.tr</a> <a href="mailto:sew@sew-eurodrive.com.tr">sew@sew-eurodrive.com.tr</a>
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<b>Sales Service</b>	<b>Dnepropetrovsk</b>	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 <a href="http://www.sew-eurodrive.ua">http://www.sew-eurodrive.ua</a> <a href="mailto:sew@sew-eurodrive.ua">sew@sew-eurodrive.ua</a>
<b>Sales</b>	<b>Kiev</b>	SEW-EURODRIVE GmbH S. Oleynika str. 21 02068 Kiev	Tel. +380 44 503 95 77 Fax +380 44 503 95 78 <a href="mailto:kso@sew-eurodrive.ua">kso@sew-eurodrive.ua</a>



<b>USA</b>			
<b>Production Assembly Sales Service</b>	<b>Greenville</b>	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 <a href="http://www.seweurodrive.com">http://www.seweurodrive.com</a> <a href="mailto:cslyman@seweurodrive.com">cslyman@seweurodrive.com</a>
<b>Assembly Sales Service</b>	<b>San Francisco</b>	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 <a href="mailto:cshayward@seweurodrive.com">cshayward@seweurodrive.com</a>
	<b>Philadelphia/PA</b>	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 <a href="mailto:csbridgeport@seweurodrive.com">csbridgeport@seweurodrive.com</a>
	<b>Dayton</b>	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 <a href="mailto:cstroy@seweurodrive.com">cstroy@seweurodrive.com</a>
	<b>Dallas</b>	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 <a href="mailto:csdallas@seweurodrive.com">csdallas@seweurodrive.com</a>
Additional addresses for service in the USA provided on request!			
<b>Venezuela</b>			
<b>Assembly Sales Service</b>	<b>Valencia</b>	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 <a href="http://www.sew-eurodrive.com.ve">http://www.sew-eurodrive.com.ve</a> <a href="mailto:seventas@cantv.net">seventas@cantv.net</a> <a href="mailto:sefinanzas@cantv.net">sefinanzas@cantv.net</a>





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## How we're driving the world

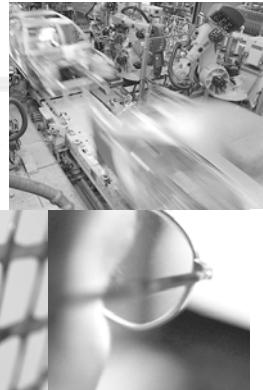
With people who think fast and develop the future with you.

With a worldwide service network that is always close at hand.

With drives and controls that automatically improve your productivity.

With comprehensive knowledge in virtually every branch of industry today.

With uncompromising quality that reduces the cost and complexity of daily operations.



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