

PLC EduTrainer Universal/Compact

FESTO

Control Technology

Operating instructions



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For the sake of readability throughout these operating instructions, all gender-specific terms are to be considered to refer to both the feminine and the masculine form, except when referring to a particular person.



CAUTION

These operating instructions must always be available to the user.
The operating instructions must be read before commissioning.
The safety instructions must be observed
Non-observance may result in severe personal injury or damage to property.

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1 General requirements for operating the devices

General requirements for safe operation of the devices:



- National regulations for operating electrical systems and equipment must be observed in commercial facilities.
- The laboratory or classroom must be overseen by a supervisor.
 - A supervisor is a qualified electrician or a person who has been trained in electrical engineering, knows the respective safety requirements and safety regulations and whose training has been documented accordingly.



The laboratory or the classroom must be equipped with the following devices:



- An emergency-off device must be provided.
 - At least one emergency-off device must be located within, and one outside of the laboratory or the classroom.
- The laboratory or classroom must be secured so that operating voltage and compressed air supply cannot be activated by any unauthorized persons, for example with:
 - A key switch
 - Lockable on-off valves
- The laboratory or classroom must be protected by residual current devices (RCDs).
 - Electrical devices (e.g. power supply units, compressors and hydraulic power units) may only be operated in training rooms which are equipped with residual current devices.
 - Type B residual current circuit breakers with a residual current of ≤ 30 mA must be used.
- The laboratory or classroom must be protected by overcurrent protection devices.
 - Fuses or circuit breakers
- No damaged or defective devices may be used.
 - Damaged devices must be banned from further use and removed from the laboratory or classroom.
 - Damaged connecting cables, pneumatic tubing and hydraulic hoses represent a safety risk and must be removed from the laboratory or classroom.


2 Safety instructions and pictograms

2.1 Safety instructions

	 DANGER
	<p>... indicates an imminently hazardous situation which will result in death or severe personal injury if not avoided.</p>

	 WARNING
	<p>... indicates a possibly hazardous situation which may result in death or severe personal injury if not avoided.</p>

	 CAUTION
	<p>... indicates a possibly hazardous situation which may result in moderate or slight personal injury or severe property damage if not avoided.</p>

	NOTICE
	<p>... indicates a possibly hazardous situation which may result in property damage or loss of function if not avoided.</p>

2.2 Pictograms



Hazard warning



Warning – dangerous electric voltage



Read and observe the operating and safety instructions prior to commissioning.



Information and/or references to other documentation

3 Use for intended purpose

Festo Didactic components and systems may only be used:

- For its intended use in teaching and training applications
- When its safety functions are in perfect condition

The components and systems are designed in accordance with the latest technology and recognized safety rules. Nevertheless, incorrect use can lead to risk of severe or fatal injury for the user and third parties and damage to the components.

The learning system from Festo Didactic has been developed and produced exclusively for education and training in the field of automation technology. The training company and/or trainers must ensure that all apprentices observe the safety precautions described in these operating instructions.

Festo Didactic hereby excludes any and all liability for damages suffered by trainees, the training company and/or any third parties, which occur during use of the device in situations which serve any purpose other than training and/or vocational education, unless such damages have been caused by Festo Didactic due to malicious intent or gross negligence.



4 For your safety

4.1 Important information

Knowledge of the basic safety instructions and safety regulations is a fundamental prerequisite for safe handling and trouble-free operation of Festo Didactic components and systems.

These operating instructions include the most important instructions for safe use of the components and systems. In particular, the safety instructions must be adhered to by all persons who work with these components and systems. Furthermore, all pertinent accident prevention rules and regulations which are applicable at the respective place of use must be adhered to.

	 WARNING
	<p>Malfunctions which could impair safety must be eliminated immediately!</p>

	 CAUTION
	<p>Improper repairs or modifications may result in unforeseeable operating states. Do not carry out any repairs or changes to the components and systems that are not described in these operating instructions.</p>

4.2 Obligations of the operating company

The operating company undertakes to allow only those persons to work with the components and systems who:

- Are familiar with the basic regulations regarding work safety and accident prevention and have been instructed in the use of the components and systems.
- Have read and understood the safety chapter and warnings in these operating instructions.

Personnel should be tested at regular intervals for safety-conscious work habits.



4.3 Obligations of the trainees

All persons who have been entrusted to work with the components and systems undertake to complete the following steps before beginning work:



- Read the chapter concerning safety and the warnings in these operating instructions.
- Familiarize themselves with the basic regulations regarding work safety and accident prevention.

5 Work and safety instructions

5.1 General



	 CAUTION
	<ul style="list-style-type: none"> • Trainees should only work with the circuits under the supervision of an instructor. • Observe the specifications included in the technical data for the individual components, and in particular all safety instructions! • Wear personal safety equipment (safety glasses, safety shoes) when working on circuits.



5.2 Mechanical safety



	 CAUTION
	<ul style="list-style-type: none"> • Set all components up so that it's easy to activate the switches and interrupters. • The ventilation slits of power supply units must not be covered. The devices must be placed on hard, flame-resistant surfaces so that the air can enter the devices unhindered. The devices are primarily cooled by convection. • Unused slots of the holder system must be covered with 19" blanking plates. • Unused cable entries of the holder system must be covered with covers included with the holder system.

5.3 Electrical safety

The power supply unit is constructed to protection class I as per EN 61558-1. It is equipped with a mains cable with PE conductor and must only be operated with, or connected to, 110/230 V AC systems with protective grounding.

	 DANGER
	<ul style="list-style-type: none"> • Risk of death in case of interrupted protective earth conductor! <ul style="list-style-type: none"> – The PE conductor (yellow-green) must not be interrupted, either inside or outside of the device. – The insulation of the protective conductor must never be damaged or removed. • Risk of death from series connection of power supply units! Contact voltages of > 25 V AC or > 60 V DC are not permissible. Coming into contact with voltages of > 50 V AC or 120 V DC may be fatal. <ul style="list-style-type: none"> – Do not connect voltage sources in series. • Risk of death due to electric shock! Protect the outputs of the power supply units (output sockets/terminals) and connector cables connected to them from direct contact. <ul style="list-style-type: none"> – Only use connector cables with adequate insulation and electric strength. – Use safety sockets with fully shrouded contact points.



	 WARNING
	<ul style="list-style-type: none"> • Disconnect from all sources of electrical power. <ul style="list-style-type: none"> – Switch off the power supply before working on the circuit. – Please note that electrical energy may be stored in individual components. Further information on this issue is available in the data sheets and operating instructions included with the components. – Caution! Capacitors inside the device may still be charged even after being disconnected from all sources of voltage. • When working under electrical voltage: Use only expressly suitable tools.

	 CAUTION
	<ul style="list-style-type: none"> • The power pack must only be operated using a power supply with a PE conductor. • Never switch on your power supply unit immediately if it is moved from a cold room to a warm one. The condensate that forms can, under unfavourable conditions, damage your device. Leave the device switched off until it has reached room temperature. • Establishing and disconnecting electrical connections <ul style="list-style-type: none"> – Electrical connections may only be established in the absence of voltage. – Electrical connections may only be disconnected in the absence of voltage. – Always pull on the plug when disconnecting connecting cables; never pull the cable. • Maximum permissible current loads for cables and devices must not be exceeded. <ul style="list-style-type: none"> – Always compare the current ratings of the device, the cable and the fuse. – In the event that these are not the same, use a separate upstream fuse in order to provide appropriate overcurrent protection. • Use only connecting cables with safety plugs for electrical connections. • When laying connecting cables, make sure they are not kinked or pinched. • Do not lay cables over hot surfaces. <ul style="list-style-type: none"> – Hot surfaces are identified with a corresponding warning symbol. • Make sure that connecting cables are not subjected to continuous tensile loads. • Devices with a ground connection must always be grounded. <ul style="list-style-type: none"> – If a grounding terminal (green-yellow laboratory socket) is available, it must always be connected to the protective grounding. The protective grounding must always be connected first (before voltage) and must always be disconnected last (after voltage). – Some devices have a high leakage current. These devices must be additionally grounded with a PE conductor. • When replacing fuses, use specified fuses only with the correct current ratings and tripping characteristics. • The device is not equipped with an integrated fuse unless otherwise specified in the technical data. • In the case of <ul style="list-style-type: none"> – Visible damage, – malfunction, – incorrect storage or – incorrect transport hazard-free operation of the device is no longer possible. <ul style="list-style-type: none"> – Switch off the power supply immediately. – Protect the device against inadvertent restart.

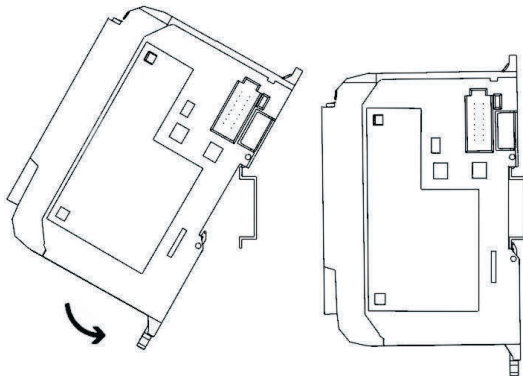
6 Assembly instructions

	 WARNING
	<p>Assembly work must only be carried out when the power supply plug is unplugged.</p>

6.1 Assembling controllers

	 CAUTION
	<p>Controllers or extension modules must not be disassembled from the H-rail in wired condition. Remove all cable connections before disassembling a controller or extension module.</p>

6.1.1 Allen Bradley



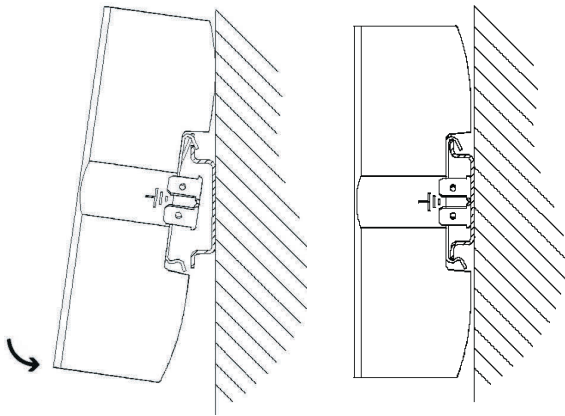
- Assembly:
 1. Hook the upper groove onto the H-rail.
 2. Press the controller downwards and simultaneously against the H-rail until the mounting latch engages. Make sure that the two mounting latches are in the upper (secured) position.

- Disassembly:
 1. Insert a flat-blade screwdriver in the mounting latch on the underside of the controller.
 2. Hold the controller and lever the mounting latch downwards. The latch remains in the open position. Repeat the process for the second mounting latch. You can now remove the controller from the H-rail.



Further information on assembling or disassembling the controller or individual extension modules can be found in the manuals of the respective controller manufacturers.

6.1.2 Festo

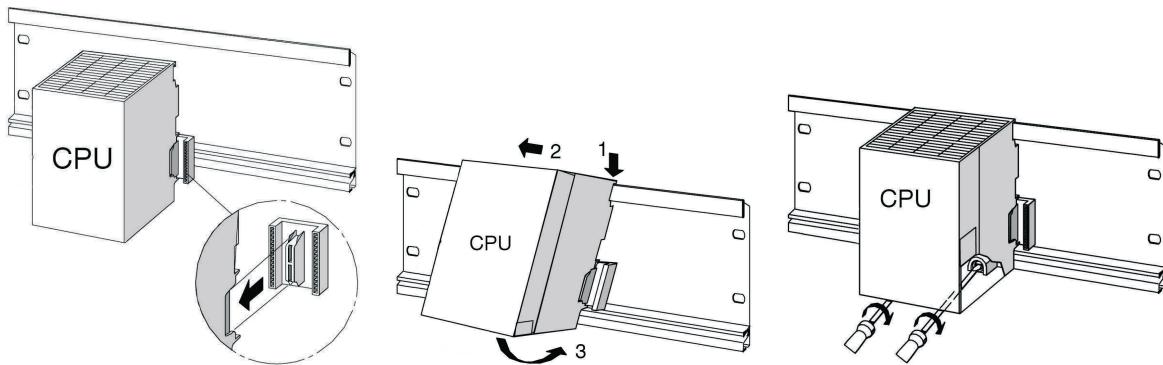


- Assembly:
 1. Tilt the controller and lean it against the wall above the H-rail.
 2. Move the controller downwards until the H-rail clips touch the H-rail.
 3. Press the lower half of the controller against the H-rail.
- Disassembly:
 1. Hold the controller housing by placing your thumb on the underside of the controller and the fingers of the same hand on the top.
 2. Lever the controller away from the H-rail by applying moderate pressure to the underside with your thumb and pulling it towards you. A distinct click lets you know that the device is now unlatched and can be removed from the H-rail.



Further information on assembling or disassembling the controller or individual extension modules can be found in the manuals of the respective controller manufacturers.

6.1.3 Siemens



– Assembly:

1. Establish a connection with the other modules by inserting a bus connector into the CPU (see picture detail).
2. Mount the CPU (1).
3. Push the CPU over as far as the left-hand module (2).
4. Now tilt it downwards (not before) (3).
5. Hand-tighten the modules onto the mounting rail.
6. If you are using a CPU with MMC, insert this into the module slot.
7. You must assemble one digital input module and one digital output module on the right beside the CPU. To do this, repeat steps 1 to 6.



CAUTION

Only the internal power pack, the ER power pack or the tabletop power pack from Festo Didactic may be used. Any other power packs are impermissible.



Further information on assembling or disassembling the controller or individual extension modules can be found in the manuals of the respective controller manufacturers.

6.1.4 Mitsubishi

- Assembly:
The controller is assembled by engaging it on the H-rail (EN 50022).
- Disassembly:
The controller is disassembled by lifting the quick fastener using a screwdriver and removing the controller from the rail.

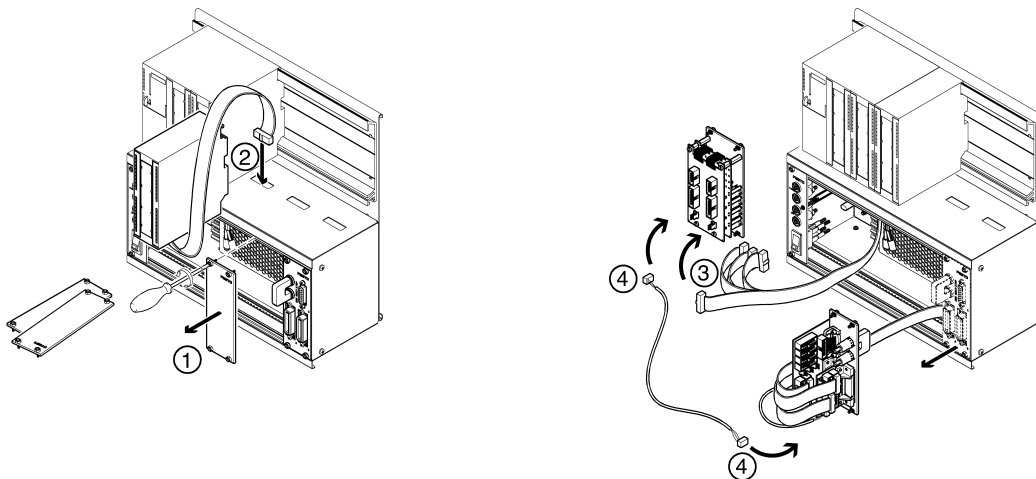


Further information on assembling or disassembling the controller or individual extension modules can be found in the manuals of the respective controller manufacturers.

6.2 Extension with additional inputs/outputs

The installation process is shown using a Siemens controller as an example. This process is essentially the same for all controllers; the only difference is how the controller is mounted on the holder system.

1. Remove as many blanking plates as necessary.
2. Guide the flat cable of the new I/O module through the cable entry into the housing and assemble the module.
3. Connect the flat cables with the chosen 19-inch module.
4. To do this, connect the new 19-inch module with the last 19-inch module connected (e.g. SysLink system connector module) via the 3-pin 24 V power supply cable.

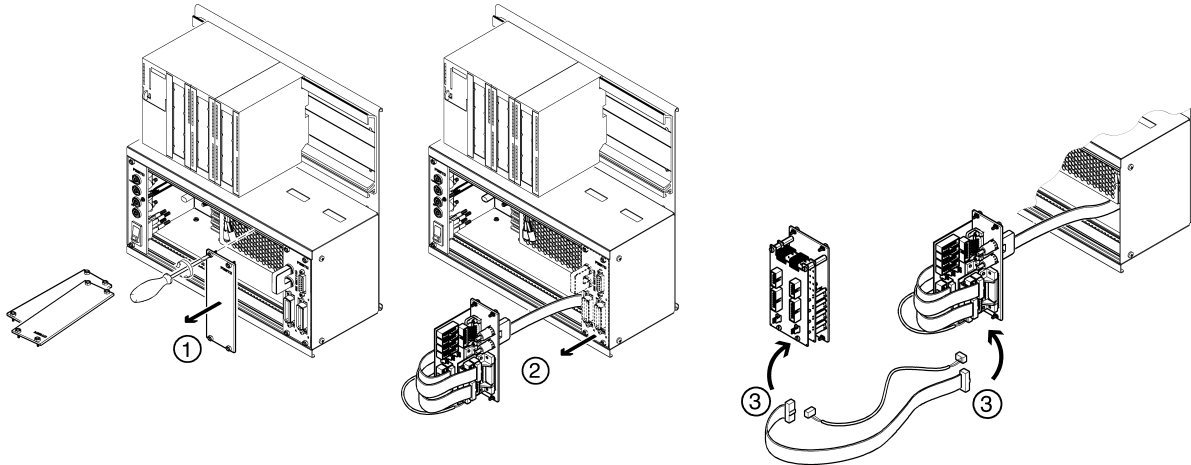




CAUTION


- Unused slots must be covered with 19" blanking plates.
- Unused cable entries must be covered with the covers included with the holder system.

6.3 Connecting 19-inch modules in parallel

1. Remove as many blanking plates as necessary.
2. Remove the 19-inch module to which you want to connect a new 19-inch module in parallel (e.g. the SysLink system connector module).
3. Connect the extension module with the SysLink module. The specific push-in connector can be found in the description for the respective 19-inch modules in this manual.

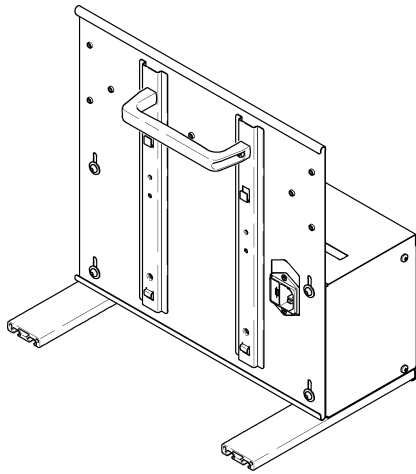


	 CAUTION
	<ul style="list-style-type: none"> • Unused slots must be covered with 19" blanking plates. • Unused cable entries must be covered with the covers included with the holder system.

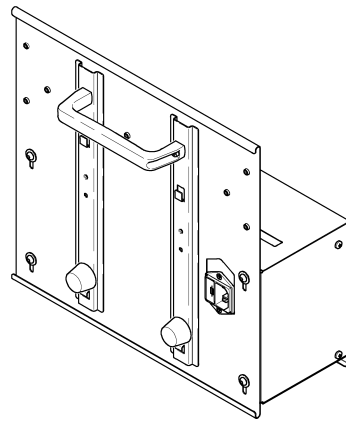
	NOTICE
	<p>The analog connections to 4 mm safety sockets on the 19" module (4AIN/2AOUT) and the analog connections to Sub-D socket C on the 19" module (SysLink system connector) must not be operated in parallel or connected at the same time. This can lead to incorrect signals to human beings and damage to components.</p>

6.4 Converting the holder system

The holder system can be easily converted from a rack variant to an A4 variant and vice versa.



Rack variant

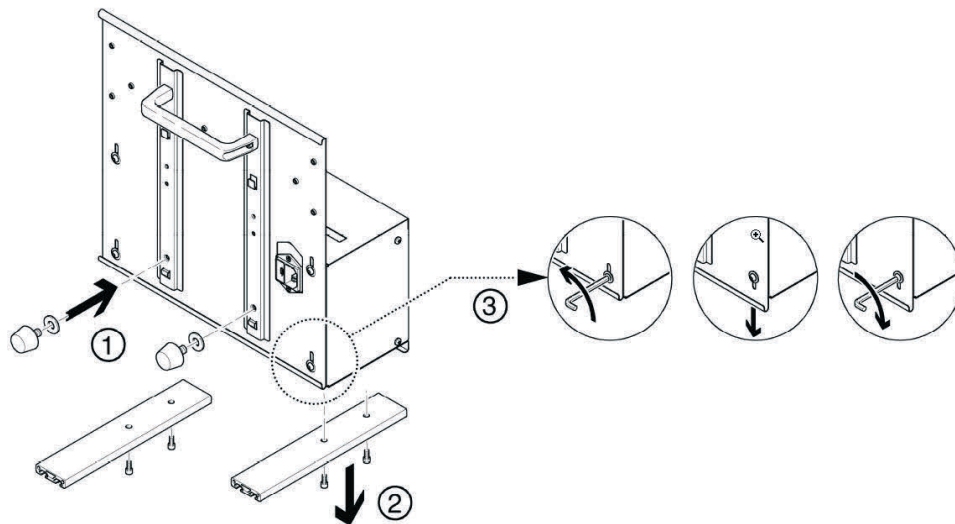


A4 variant

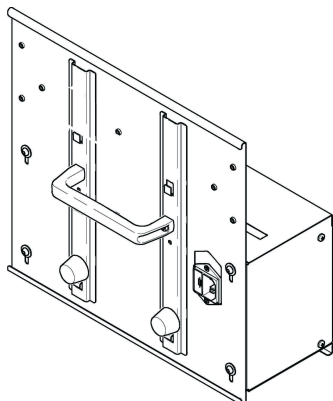
Converting the rack variant to an A4 variant

The respective conversion kit can be ordered from Festo Didactic.

1. Screw in and tighten the rubber buffers and washers by hand.
2. Loosen the aluminium rails using an Allen key and remove.
3. Loosen the screws on the housing back wall using an Allen key, shift the housing back wall downwards to the stop, and retighten the screws on the housing back wall.



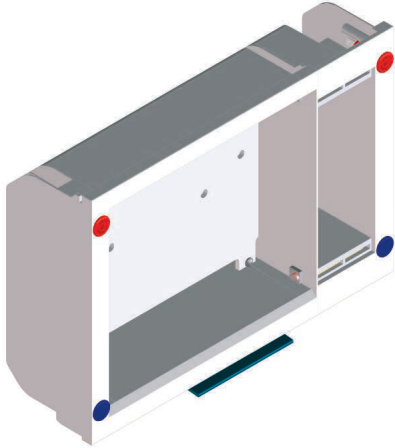
If you want to place the A4 variant at an angle on the table, you must assemble the handle in the position shown below.



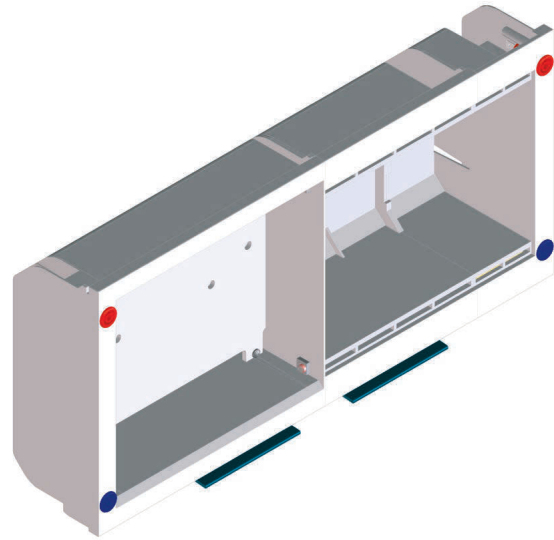
7 Holder systems

The holder systems included with the EduTrainer Compact and EduTrainer Universal product ranges are described in the following sections.

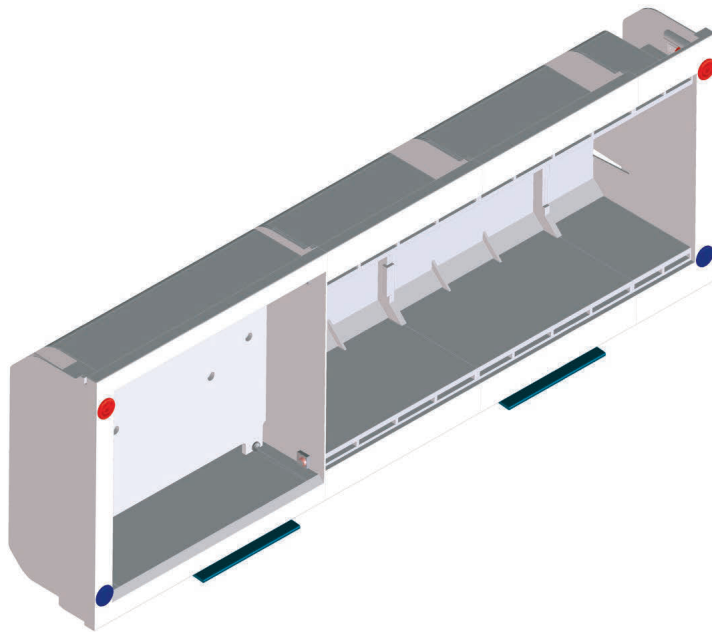
7.1 EduTrainer Compact holder system



Size 1: ER end housing (left) for mounting the controller with various mounting rails and ER end housing (right) for mounting 19" modules with a width of up to 9 HP



Size 2: ER end housing (left) for mounting the controller with various mounting rails, ER middle housing and ER end housing (right) for mounting 19" modules with a width of up to 33 HP



Size 3: ER end housing (left) for mounting the controller with various mounting rails, two ER middle housings and ER end housing (right) for mounting 19" modules with a width of up to 57 HP

7.1.1 Design and function

The EduTrainer Compact holder system makes it possible to combine controllers from various manufacturers with simulation plates and 4 mm connection plates. Holder systems are available in three different sizes.

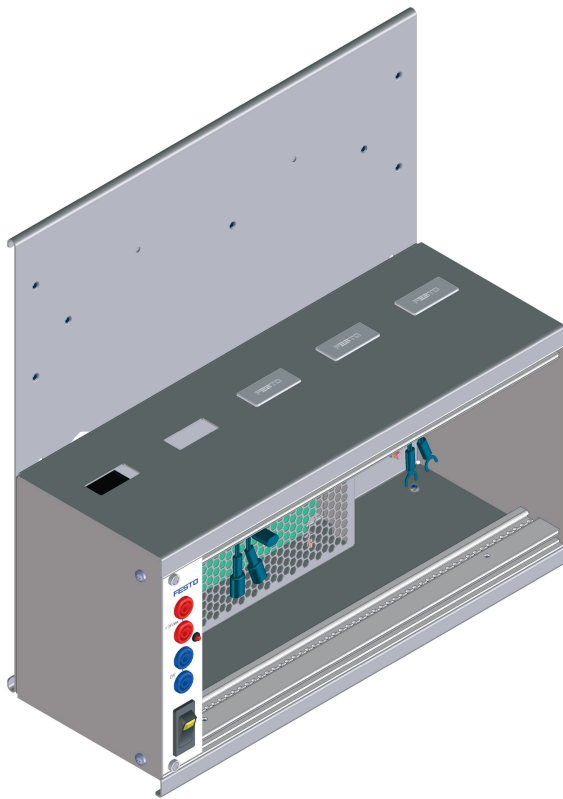
7.1.2 Commissioning

Connect the EduTrainer Compact to a 24 V DC power supply using laboratory cables with 4 mm safety sockets.

7.1.3 Technical data

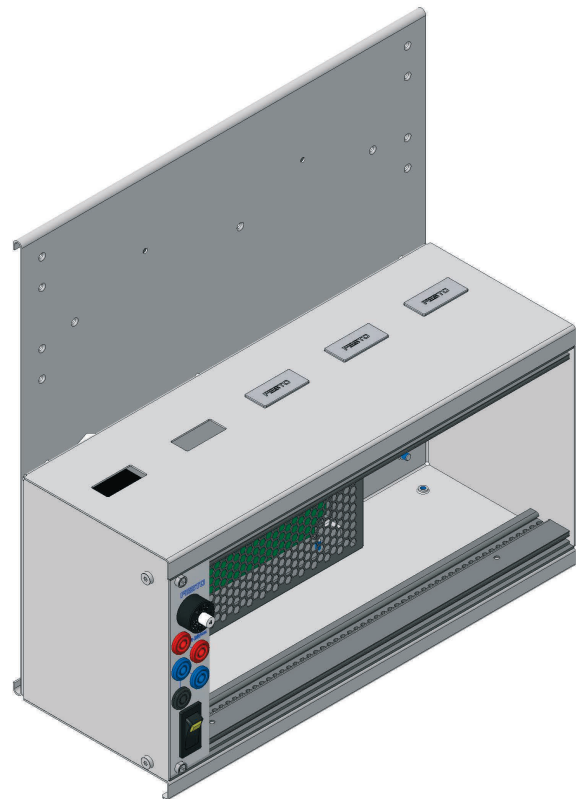
Electrical/mechanical	
Operating voltage	24 V DC
Output voltage	Corresponds to input voltage
Connection	4 mm safety sockets 3-pin plug for internal power supply to the modules
Size 1	171 x 243 x 82 mm (PLC plus 9 HP)
Size 2	171 x 365 x 82 mm (PLC plus 33 HP)
Size 3	171 x 487 x 82 mm (PLC plus 57 HP)
Maximum PLC width/height	160 mm/130 mm
CE marking	in accordance with EU-EMC Directive in accordance with RoHS Directive
Subject to change	

7.2 EduTrainer Universal holder system



Holder system EduTrainer Universal with 19" power supply module (old version)

The mains switch with indicator, a control LED for 24 V and 4 mm safety sockets for 24 V and 0 V are located on the front panel.



Holder system EduTrainer Universal with "limited power" 19" power supply module (new version)

The mains switch with indicator, a control LED for 24 V, a resettable 4 A fuse, 4 mm safety sockets for 24 V and 0 V, and a safety socket for connection to functional ground are located on the front panel.

7.2.1 Design and function

The holder system of the EduTrainer Universal enables controllers supplied by different manufacturers to be combined with simulation plates and 4 mm base plates. The holder system is available in two sizes and two variants.



With and without power supply unit

The standard variant of the EduTrainer Universal includes a power supply unit with a switch. However, it can also be powered by an external power supply.

The integrated simulation plates and 4 mm base plates are supplied with power via the built-in 19" power supply module and switched on and off centrally using a rocker switch.

If the fuse on the "limited power" 19" power supply module is tripped, it can be reset by pressing the white button.

7.2.2 Commissioning

	 WARNING
	<p>Electric shock</p> <p>When the mains cable is plugged in, the line between the mains switch and the power supply unit is live (110/230 V AC).</p> <p>Assembly work must only be carried out when the power supply connector is unplugged.</p>

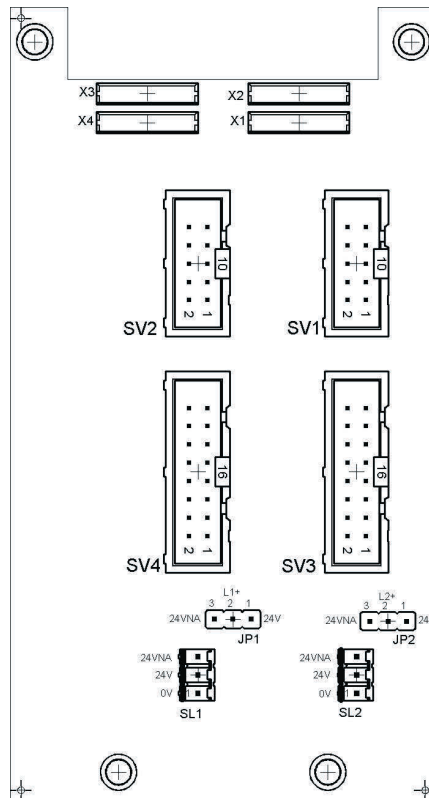
1. Assemble the required simulation plates and 4 mm connection plates if applicable.
2. Connect the EduTrainer® PLC to the laboratory power supply.
3. Switch on the mains switch.

7.2.3 Technical data

Electrical/Mechanical	
Operating voltage	110 V – 230 V AC 50 – 60 Hz
Input current	1.3 A – 0.65 A AC
Output voltage	24 V DC ± 3%
Output current	Max. 4.0 A
Fuse	3.15 A slow-blowing
Mains connection	Detachable mains supply cable IEC 60320, C13
Overvoltage category	CAT II, operation in building installations
Protection class	I, operation with protective grounding
Connection	4 mm safety sockets 3-pin plug for internal supply to modules
Front-plate width, power supply	6 HP (1 HP = 1/5" = 5.08 mm)
Size 1	297 mm x 305 mm x 120 mm (60 HP)
Size 2	297 mm x 458 mm x 120 mm (90 HP)
Maximum PLC width/height, size 1	295 mm/125 mm
Maximum PLC width/height, size 2	448 mm/125 mm

Electrical/Mechanical	
Scope of application	For indoor use only
Operating altitude	Up to 2000 m above sea level
Ambient temperature	5 ... 40 °C
Relative humidity	≤ 80% up to 31 °C
Pollution degree	2, dry, non-conductive pollution
CE marking	In accordance with low voltage directive In accordance with EU-EMC Directive In accordance with RoHS Directive
Subject to change	

8 19-inch module 16DIN



SV1, SV2: 10-pin inputs
 SV3, SV4: 16-pin inputs
 JP1, JP2: Supply via 24 V or 24 V NA
 SL1, SL2: Connections for 24 V DC supply voltage

8.1 Structure and function

The 19-inch module for 16DIN extends the functional scope of your EduTrainer PLC system. It has 16 digital inputs on 4 mm safety sockets and 16 switches/pushbuttons for signal simulation.

The input signals from a PLC are applied to the controller either via the 4 mm safety sockets or in parallel via the pushbuttons. Each pushbutton has a detenting and non-detenting function. This enables them to generate static or pulsed signals.

8.2 Commissioning

1. Connect the inputs/outputs to the PLC using a flat cable:
 - SV3/SV4: Siemens S7 (16-pin)
 - SV1/SV2: Other controller types (10-pin)
2. If using modules in parallel, these can be connected via the free insulation-displacement connector SV1/SV2 or SV3/SV4 using flat cables.
3. Connect the 24 V power supply by means of the 3-pin connector SL1 or SL2.
4. The jumpers JP1 and JP2 define that the input module is directly supplied via 24 V.
5. Screw the 19-inch module into the frame.

8.3 Technical data

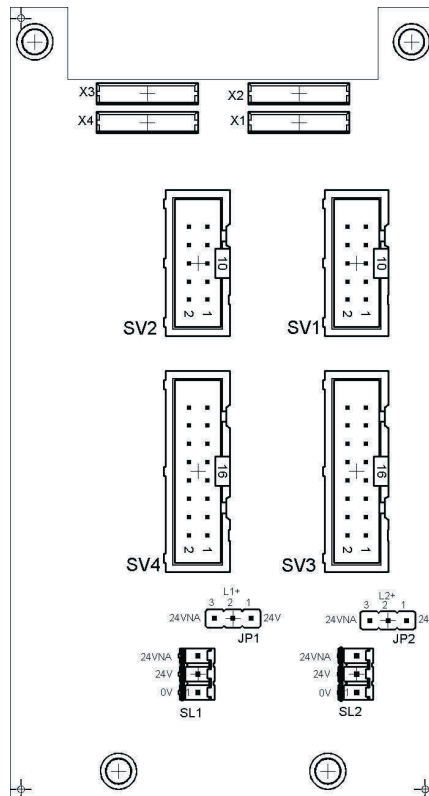
Electrical/Mechanical	
Operating voltage	24 V DC
Input voltage	0 V to operating voltage
Input impedance	See PLC manual
Current rating	Max. 4.0 A
Connection	4 mm safety sockets
Front-plate width	12 HP
Subject to change	

8.4 Contact allocation table

Pin	SV1	SV2	SV3	SV4
1	L1+	L2+	0V	0V
2	I0	I10	I7	I17
3	I1	I11	0V	0V
4	I2	I12	I6	I16
5	I3	I13	0V	0V
6	I4	I14	I5	I15
7	I5	I15	0V	0V
8	I6	I16	I4	I14

Pin	SV1	SV2	SV3	SV4
9	I7	I17	L1+	L2+
10	0V	0V	I3	I13
11	–	–	L1+	L2+
12	–	–	I2	I12
13	–	–	L1+	L2+
14	–	–	I1	I11
15	–	–	L1+	L2+
16	–	–	I0	I10

9 19-inch module 16DOUT



- SV1, SV2: 10-pin outputs
- SV3, SV4: 16-pin outputs
- JP1, JP2: Supply for output modules
via 24 V or 24 V NA
- SL1, SL2: Connections for 24 V DC supply voltage

9.1 Structure and function

The 19-inch module 16DOUT extends the functional scope of your EduTrainer PLC system. The module has 16 digital outputs on 4 mm safety sockets. Yellow status LEDs indicates the status of the outputs.

9.2 Commissioning

1. Connect the inputs/outputs to the PLC using a flat cable:
 - SV3/SV4: Siemens S7 (16-pin)
 - SV1/SV2: Other controller types (10-pin)
2. If using modules in parallel, these can be connected via the free insulation-displacement connector SV1/SV2 or SV3/SV4 using flat cables.
3. Connect the 24 V power supply by means of the 3-pin connector SL1 or SL2.
4. Use the jumper JP1 or JP2 to define whether the output module is supplied directly via 24 V or via 24 V NA. 24 V NA is switched off in the event of an EMERGENCY-STOP.
 - Jumper between pins 1 and 2: supply via 24 V.
 - Jumper between pins 2 and 3: supply via 24 V NA.
5. Screw the 19-inch module into the frame.

9.3 Technical data

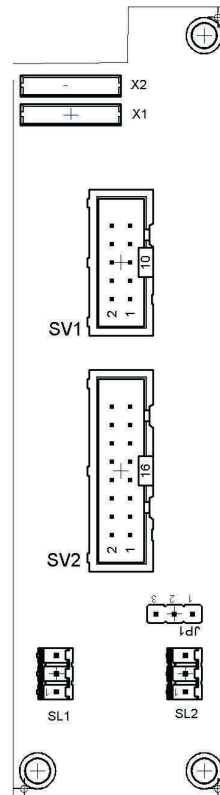
Electrical/Mechanical	
Operating voltage	24 V DC
Output current	Module: max. 0.5 A per output PLC: see PLC manual
Connection	4 mm safety sockets
Front-plate width	12 HP
Subject to change	

9.4 Contact allocation table

Pin	SV1	SV2	SV3	SV4
1	L1+	L2+	0V	0V
2	Q0	Q10	Q7	Q17
3	Q1	Q11	0V	0V
4	Q2	Q12	Q6	Q16
5	Q3	Q13	0V	0V
6	Q4	Q14	Q5	Q15
7	Q5	Q15	0V	0V
8	Q6	Q16	Q4	Q14

Pin	SV1	SV2	SV3	SV4
9	Q7	Q17	L1+	L2+
10	0V	0V	Q3	Q13
11	–	–	L1+	L2+
12	–	–	Q2	Q12
13	–	–	L1+	L2+
14	–	–	Q1	Q11
15	–	–	L1+	L2+
16	–	–	Q0	Q10

10 19-inch module 8DIN



- SV1: 10-pin inputs
- SV2: 16-pin inputs
- JP1: Supply via 24 V or 24 V NA
- SL1, SL2: Connections for 24 V DC supply voltage

10.1 Structure and function

The 19-inch module 8DIN extends the functional scope of your EduTrainer PLC system. It has 8 digital inputs on 4 mm safety sockets and 8 switches/pushbuttons for signal simulation.

The input signals from a PLC are applied to the controller either via the 4 mm safety sockets or in parallel via the pushbuttons. Each pushbutton has a detenting and non-detenting function. This enables them to generate static or pulsed signals.

10.2 Commissioning

1. Connect the inputs/outputs to the PLC using a flat cable:
 - SV2: Siemens S7 (16-pin)
 - SV1: Other controller types (10-pin)
2. If using modules in parallel, these can be connected via the free insulation-displacement connector SV1 or SV2 using flat cables.
3. Connect the 24 V power supply by means of the 3-pin connector SL1 or SL2.
4. The jumper JP1 defines that the input module is directly supplied via 24 V.
5. Screw the 19-inch module into the frame.

10.3 Technical data

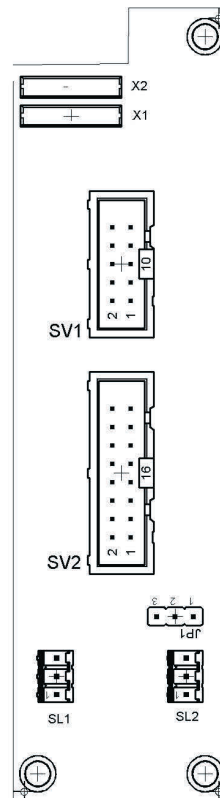
Electrical/Mechanical	
Operating voltage	24 V DC
Input voltage	0 V – operating voltage
Input impedance	See PLC manual
Current rating	Max. 4.0 A
Connection	4 mm safety sockets
Front-plate width	6 HP
Subject to change	

10.4 Contact allocation table

Pin	SV1	SV2
1	L1+	0V
2	I0	I7
3	I1	0V
4	I2	I6
5	I3	0V
6	I4	I5
7	I5	0V
8	I6	I4

Pin	SV1	SV2
9	I7	L1+
10	0V	I3
11	–	L1+
12	–	I2
13	–	L1+
14	–	I1
15	–	L1+
16	–	I0

11 19-inch module 8DIN, without switch



- SV1: 10-pin inputs
- SV2: 16-pin inputs
- JP1: power supply via 24 V or 24 V NA
- SL1, SL2: 24 V DC supply voltage terminals

11.1 Layout and function

The 19-inch module 8DIN extends the scope of functions of your EduTrainer PLC system. It's equipped with 8 digital inputs laid out as 4 mm safety sockets. Yellow status LEDs indicate the status of the inputs.

The input signals from a PLC are applied to the controller via the 4 mm safety sockets.

11.2 Commissioning

1. Connect the inputs/outputs to the PLC using a flat cable:
 - SV2: Siemens S7 (16-pin)
 - SV1: other controller types (10-pin).
2. If modules are utilized in parallel, they can be connected via unoccupied connector SV1 or SV2 with a flat cable.
3. Connect 24 V supply power to 3-pole terminal SL1 or SL2.
4. If jumper JP1 is used, the input module is supplied directly via 24 V.
5. Screw the 19" module into the rack.

11.3 Technical data

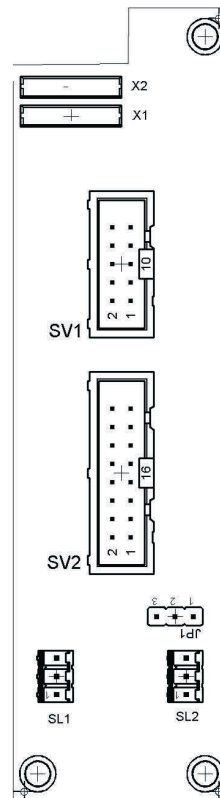
Electrical/mechanical specifications	
Operating voltage	24 V DC $\pm 3\%$
Input voltage	0 V operating voltage
Input impedance	See PLC manual
Current rating	Max. 4.0 A
Connection	4 mm safety sockets
Front panel width	6 standard width units
Subject to change	

11.4 Pin allocation table

Pin	SV1	SV2
1	L1+	0 V
2	I0	I7
3	I1	0 V
4	I2	I6
5	I3	0 V
6	I4	I5
7	I5	0 V
8	I6	I4

Pin	SV1	SV2
9	I7	L1+
10	0 V	I3
11	—	L1+
12	—	I2
13	—	L1+
14	—	I1
15	—	L1+
16	—	I0

12 19-inch module 8DOU



- SV1: 10-pin outputs
- SV2: 16-pin outputs
- JP1: Supply via 24 V or 24 V NA
- SL1, SL2: Connections for 24 V DC supply voltage

12.1 Structure and function

The 19-inch module 8DOU extends the functional scope of your EduTrainer PLC system. The module has 8 digital outputs on 4 mm safety sockets. Yellow status LEDs indicates the status of the outputs.

12.2 Commissioning

1. Connect the inputs/outputs to the PLC using a flat cable:
 - SV2: Siemens S7 (16-pin)
 - SV1: Other controller types (10-pin)
2. If using modules in parallel, these can be connected via the free insulation-displacement connector SV1 or SV2 using flat cables.
3. Connect the 24 V power supply by means of the 3-pin connector SL1 or SL2.
4. The jumper JP1 is used to define whether the output module is supplied directly via 24 V or via 24 V NA. 24 V NA is switched off in the event of an EMERGENCY-STOP.
 - Jumper between pins 1 and 2: supply via 24 V.
 - Jumper between pins 2 and 3: supply via 24 V NA.
5. Screw the 19-inch module into the frame.

12.3 Technical data

Electrical/Mechanical	
Operating voltage	24 V DC
Output current	Module: max. 0.5 A per output PLC: see PLC manual
Connection	4 mm safety sockets
Front-plate width	6 HP
Subject to change	

12.4 Contact allocation table

Pin	SV1	SV2
1	L1+	0V
2	Q0	Q7
3	Q1	0V
4	Q2	Q6
5	Q3	0V
6	Q4	Q4
7	Q5	0V
8	Q6	Q4

Pin	SV1	SV2
9	Q7	L1+
10	0V	Q3
11	–	L1+
12	–	Q2
13	–	L1+
14	–	Q1
15	–	L1+
16	–	Q0

13 19-inch module 4DOUR



13.1 Design and function

The 19-inch module 4DOUR extends the functional scope of your EduTrainer PLC system. The module connects 4 relay outputs on 4 mm safety sockets.

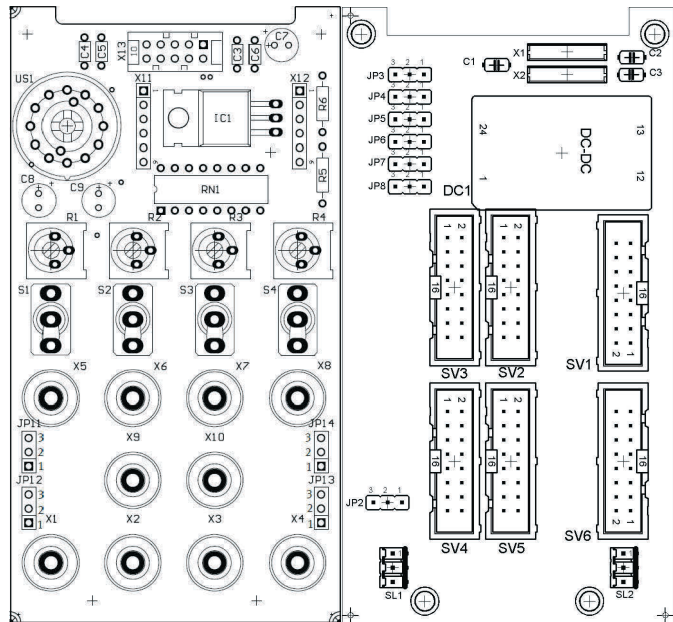
13.2 Commissioning

1. Connect the outputs by means of 8 single wires to the PLC/LOGO!
2. Screw the 19-inch module into the frame.

13.3 Technical data

Electrical/Mechanical	
Operating voltage	24 V DC \pm 3%
Switching current	10 A bei ohmic load 3 A bei inductive load
Connection	4 mm safety sockets
Front-plate width	6 HP
Subject to change	

14 19-inch module 4AIN/2AOUT



- SV3, SV4: analog inputs/outputs, S7 20-pin
- SV2, SV5: analog inputs/outputs, S7 40-pin
- SV1 or SV6: analog inputs/outputs, 16-pin
- JP2: power supply via 24 V or 24 V NA
- SL1, SL2: 24 V DC supply power terminals
- JP11, JP12, JP13, JP14: switching from 0 ... 10 V to ± 10 V
- JP3, JP4, JP5, JP6, JP7, JP8: Pos. 1/2 voltage inputs,
Pos. 2/3 current inputs

14.1 Layout and function

The 19-inch module 4AIN/2AOUT extends the functional scope of your EduTrainer PLC system. The module enables the connection of 4 analog voltage inputs and 2 analog voltage outputs of a PLC via 4 mm safety sockets. The voltage values are shown on the integrated display. The displayed voltage is selected via a selector switch.

If the toggle switch points towards the 4 mm safety socket, process signals are recorded. If the toggle switch points towards the potentiometer, an adjustable voltage can be supplied by turning the potentiometer knob.

The voltage range can be selected with jumpers JP11 (UR1), JP12 (UR2), JP13 (UR3) and JP14 (UR4). Voltage can be set to between 0 and 10 V by inserting a jumper between pins 2 and 3. Inserting a jumper between pins 1 and 2 results in a setting range of ± 10 V.

14.2 Commissioning

1. Connect the inputs/outputs to the PLC using a flat cable:
 - SV2/SV5: Siemens S7 integrated analog module with 40-pin plug (2 x 16-pin)
 - SV1/SV6: Other controller types (16-pin)
2. If using modules in parallel, these can be connected via the free insulation-displacement connector SV1 or SV6 using flat cables.
3. Connect the 24 V power supply by means of the 3-pin connector SL1 or SL2.
4. Use the jumper JP2 to define whether the output module is supplied directly via 24 V or via 24 V NA. 24 V NA is switched off in the event of an EMERGENCY-STOP.
 - Jumper between pins 1 and 2: supply via 24 V.
 - Jumper between pins 2 and 3: supply via 24 V NA.
5. Screw the 19-inch module into the frame.

14.3 Technical data

Electrical/Mechanical	
Operating voltage	24 V DC \pm 3%
Input/output voltage	0 – 10 V DC and \pm 10 V DC respectively
Input impedance	See PLC manual
Output current	Module: max. 0.5 A per output PLC: see PLC manual
Measuring device tolerance	\pm 1%
Connection	4 mm safety sockets
Front-plate width	12 HP
Subject to change	



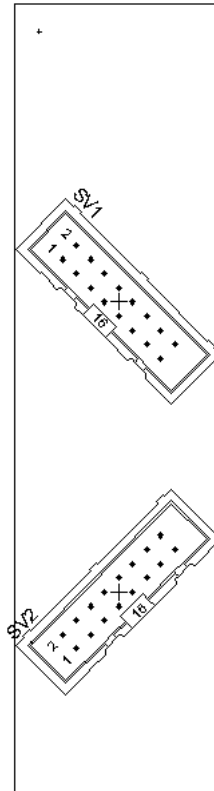
NOTICE

The analog connections to 4 mm safety sockets on the 19" module (4AIN/2AOUT) and the analog connections to Sub-D socket C on the 19" module (SysLink system connector) must not be operated in parallel or connected at the same time. This can lead to incorrect signals to human beings and damage to components.

14.4 Contact allocation table

Pin	SV1	SV2	SV3	SV4	SV5	SV6
1	UA1	0V	IE3	0V	0V	UA1
2	IA2	IE3	0V	IA2	IA2	IA2
3	UA2	0V	IE3	0V	0V	UA2
4	IA1	UE3	UE3	0V	UA2	IA1
5	0V	0V	IE3	0V	0V	0V
6	—	0V	IE2	UA2	IA1	—
7	IE2	0V	IE3	0V	0V	IE2
8	IE4	IE2	0V	IA1	UA1	IE4
9	IE1	L1	L1	UE4	UE4	IE1
10	IE3	UE2	UE2	0V	—	IE3
11	0V	L1	L1	UE4	UE4	0V
12	UE4	0V	IE1	UA1	—	UE4
13	UE2	L1	L1	UE4	UE4	UE2
14	UE3	IE1	0V	IE4	0V	UE3
15	UE1	L1	L1	UE4	UE4	UE1
16	—	UE1	UE1	0V	IE4	—

15 19-inch module 4AIN/2AOUT, without simulation



SV1, SV2: outputs, 16-pin

15.1 Layout and function


The 19" module 4AIN/2AOUT extends the scope of functions of your EduTrainer PLC system. The module permits connection of 4 analog voltage inputs and 2 analog voltage outputs of a PLC via 4 mm safety sockets.

15.2 Commissioning

1. Connect the inputs/outputs to the PLC using a ribbon cable:
 - SV1/SV2: other controller types (16-pin).
2. If modules are utilized in parallel, they can be connected via unoccupied connector SV1 or SV2 with a ribbon cable.
3. Screw the 19" module into the frame.

15.3 Technical data

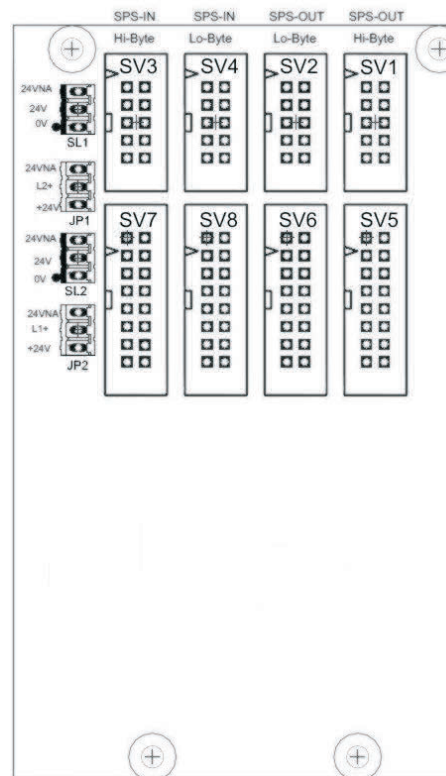
Electrical/mechanical specifications	
Operating voltage	24 V DC \pm 3%
Input/output voltage	0 to 10 V DC or \pm 10 V DC
Input impedance	See PLC manual
Output current	Module: max. 4.0 A per output PLC: see PLC manual
Connection	4 mm safety sockets
Front panel width	6 standard width units
Subject to change	

	NOTICE
	<p>The analog connections to 4 mm safety sockets on the 19" module (4AIN/2AOUT) and the analog connections to Sub-D socket C on the 19" module (SysLink system connector) must not be operated in parallel or connected at the same time. This can lead to incorrect signals to human beings and damage to components.</p>

15.4 Pin allocation table

Pin	SV1	SV2
1	UA1	UA1
2	IA2	IA2
3	UA2	UA2
4	IA1	IA1
5	0V	0V
6	—	—
7	IE2	IE2
8	IE4	IE4
9	IE1	IE1
10	IE3	IE3
11	0V	0V
12	UE4	UE4
13	UE2	UE2
14	UE3	UE3
15	UE1	UE1
16	—	—

16 19-inch module for word processing



- SV1, SV2: 10-pin outputs (high/low byte)
- SV3, SV4: 10-pin inputs (high/low byte)
- SV5, SV6: 16-pin outputs (high/low byte)
- SV7, SV8: 16-pin inputs (high/low byte)
- JP1, JP2: Supply via 24 V or 24 V NA
- SL1, SL2: Connections for 24 V DC supply voltage



NOTICE

This module is designed for direct connection to a PLC and must not be connected in parallel with other modules. This could damage the module outputs.

16.1 Structure and function

The 19-inch module for word processing extends the functional scope of your EduTrainer PLC system. It has 16 digital inputs and 16 digital outputs, a two-line display and 4 pushbuttons for setting the input and output values.

The input and output signals of the module are connected with the outputs/inputs of the PLC via 10-pin and 16-pin flat connectors. The value of the PLC's input word can be set via a keypad. The PLC's input/output word is shown on a two-line display. The input/output word can be displayed in hexadecimal (HEX), decimal (DEC) or binary-coded decimal (BCD) format.

16.2 Commissioning

1. Connect the inputs/outputs to the PLC using a flat cable:
 - SV5/SV6/SV7/SV8: Siemens S7 (16-pin)
 - SV1/SV2/SV3/SV4: Other controller types (10-pin)
2. Connect the 24 V power supply by means of the 3-pin insulation-displacement connector SL1 or SL2.
3. The jumpers JP1 and JP2 define that the input module is directly supplied via 24 V.
4. Screw the 19-inch module into the frame.

16.3 Operation

The PLC's output word is shown directly in the second line of the display. To change the format of the display, proceed as follows:

- Keep pressing the → key until the cursor flashes at the end of the second line.
- Change the display format using the ↑↓ keys.
- Save your settings using the ENTER key.

The value of the PLC's input word is shown in the first line of the display. To change the value, proceed as follows.

- Select the element of the input word to be changed using the → key. It is indicated by the flashing cursor.
- Set the required value using the ↑↓ keys.
- Once all elements of the input word are set, confirm the input using the ENTER key. This confirmation outputs the set value to the PLC.

The display format is set as for the output word.

16.4 Technical data

Electrical/Mechanical	
Operating voltage	24 V DC
Input voltage	0 V – operating voltage
Input impedance	See PLC manual
Output voltage/output current	Operating voltage/0.3 mA, not short circuit proof
Connection	10/16-pin flat connector
Front-plate width	12 HP
Subject to change	

16.5 Contact allocation table

Pin	SV1	SV2	SV3	SV4	SV5	SV6	SV7	SV8
1	L2+	L2+	L1+	L1+	0V	0V	0V	0V
2	Q8	Q0	I8	I0	Q8	Q0	I8	I0
3	Q9	Q1	I9	I1	0V	0V	0V	0V
4	Q10	Q2	I10	I2	Q9	Q1	I9	I1
5	Q11	Q3	I11	I3	0V	0V	0V	0V
6	Q12	Q4	I12	I4	Q10	Q2	I10	I2
7	Q13	Q5	I13	I5	0V	0V	0V	0V
8	Q14	Q6	I14	I6	Q11	Q3	I11	I3
9	Q15	Q7	I15	I7	L2+	L2+	L1+	L1+
10	0V	0V	0V	0V	Q12	Q4	I12	I4
11	–	–	–	–	L2+	L2+	L1+	L1+
12	–	–	–	–	Q13	Q5	I13	I5
13	–	–	–	–	L2+	L2+	L1+	L1+
14	–	–	–	–	Q14	Q6	I14	I6
15	–	–	–	–	L2+	L2+	L1+	L1+
16	–	–	–	–	Q15	Q7	I15	I7

17 19-inch module for 37-pin system connector



17.1 Structure and function

The 19-inch module for 37-pin system connector extends the functional scope of your EduTrainer PLC system. It enables the connection of 32 digital inputs via a 37-pin Sub-D plug as well as 32 digital outputs via a 37-pin Sub-D socket.

17.2 Commissioning

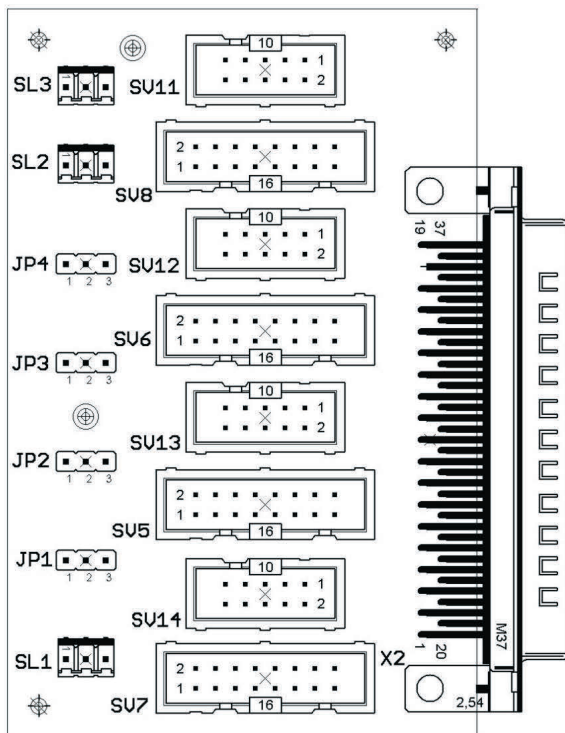
1. Connect the inputs/outputs to the PLC using a flat cable:
 - SV7/SV5/SV6/SV8: Siemens S7 (16-pin)
 - SV14/SV13/SV12/SV11: Other controller types (10-pin)
2. If using modules in parallel, these can be connected via the free insulation-displacement connector SV7/SV5/ SV6/SV8 or SV14/SV13/SV12/SV11 using flat cables.
3. Connect the 24 V power supply by means of the 3-pin connector SL1, SL2 or SL3.
4. The jumpers JP1, JP2, JP3 and JP4 define whether the PLC module is supplied directly via 24 V or via 24 V NA. 24 V NA is switched off in the event of an EMERGENCY-STOP.
 - Jumper between pins 1 and 2: supply via 24 V.
 - Jumper between pins 2 and 3: supply via 24 V NA.
5. Screw the 19-inch module into the frame.

17.3 Technical data

Electrical/Mechanical	
Operating voltage	24 V DC
Input voltage	Max. 24 V DC
Output current	Module: max. 0.5 A per output PLC: see PLC manual
Connection, outputs	37-pin Sub-D socket
Connection, inputs	37-pin Sub-D plug
Front-plate width	9 HP
Subject to change	

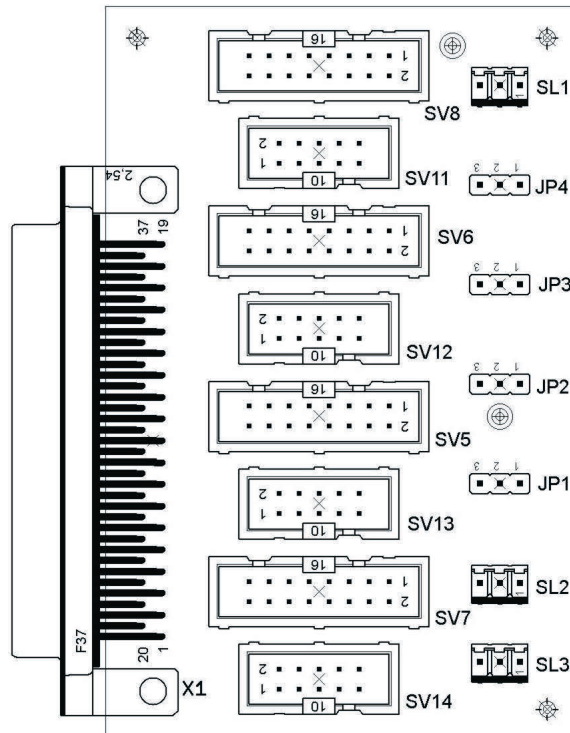
17.4 Contact allocation table

Plugs PLC inputs



SV14, SV13, SV12, SV11: 10-pin outputs
 SV7, SV5, SV6, SV8: 16-pin outputs
 JP1, JP2, JP3, JP4: Supply via 24 V or 24 V NA
 SL1, SL2, SL3: Connections for 24 V DC supply voltage

Sockets PLC outputs



SV14, SV13, SV12, SV11: 10-pin inputs
 SV7, SV5, SV6, SV8: 16-pin inputs
 JP1, JP2, JP3, JP4: Supply via 24 V or 24 V NA
 SL1, SL2, SL3: Connections for 24 V DC supply voltage

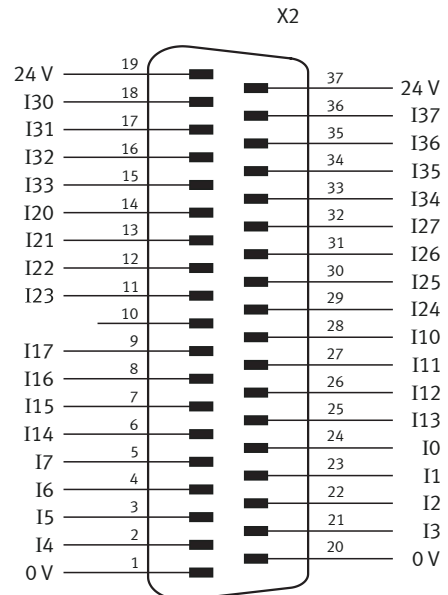
Pin	SV7	SV14	SV5	SV13	SV6	SV12	SV8	SV11
1	0 V	L1+	0 V	L2+	0 V	L1+	0 V	L2+
2	I7	I0	I17	I10	I27	I20	I37	I30
3	0 V	I1	0 V	I11	0 V	I21	0 V	I31
4	I6	I2	I16	I12	I26	I22	I36	I32
5	0 V	I3	0 V	I13	0 V	I23	0 V	I33
6	I5	I4	I15	I14	I25	I24	I35	I34
7	0 V	I5	0 V	I15	0 V	I25	0 V	I35
8	I4	I6	I14	I16	I24	I26	I34	I36
9	L1+	I7	L2+	I17	L1+	I27	L2+	I37
10	I3	0 V	I13	0 V	I23	0 V	I33	0 V
11	L1+	–	L2+	–	L1+	–	L2+	–
12	I2	–	I12	–	I22	–	I32	–
13	L1+	–	L2+	–	L1+	–	L2+	–
14	I1	–	I11	–	I21	–	I31	–
15	L1+	–	L2+	–	L1+	–	L2+	–
16	I0	–	I10	–	I20	–	I30	–

Allocation of the insulation-displacement connectors (PLC inputs)

Pin	X2
1	0 V
2	I4
3	I5
4	I6
5	I7
6	I14
7	I15
8	I16
9	I17
10	–
11	I23
12	I22

Pin	X2
13	I21
14	I20
15	I33
16	I32
17	I31
18	I30
19	24 V
20	0 V
21	I3
22	I2
23	I1
24	I0

Pin	X2
25	I13
26	I12
27	I11
28	I10
29	I24
30	I25
31	I26
32	I27
33	I34
34	I35
35	I36
36	I37
37	24 V



Allocation of the 37-pin plug (PLC inputs)

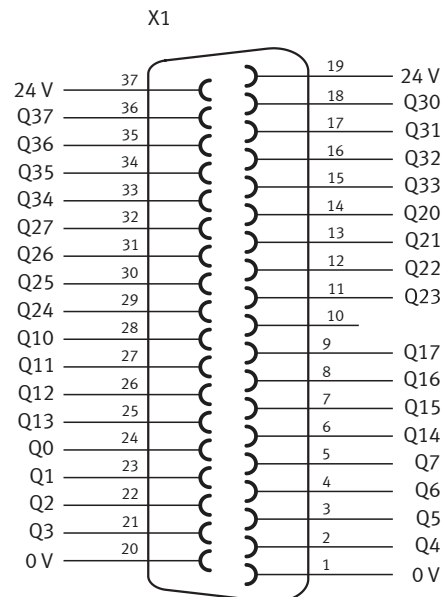
Pin	SV7	SV14	SV5	SV13	SV6	SV12	SV8	SV11
1	0 V	L1+	0 V	L2+	0 V	L3+	0 V	L4+
2	Q7	Q0	Q17	Q10	Q27	Q20	Q37	Q30
3	0 V	Q1	0 V	Q11	0 V	Q21	0 V	Q31
4	Q6	Q2	Q16	Q12	Q26	Q22	Q36	Q32
5	0 V	Q3	0 V	Q13	0 V	Q23	0 V	Q33
6	Q5	Q4	Q15	Q14	Q25	Q24	Q35	Q34
7	0 V	Q5	0 V	Q15	0 V	Q25	0 V	Q35
8	Q4	Q6	Q14	Q16	Q24	Q26	Q34	Q36
9	L1+	Q7	L2+	Q17	L3+	Q27	L4+	Q37
10	Q3	0 V	Q13	0 V	Q23	0 V	Q33	0 V
11	L1+	–	L2+	–	L3+	–	L4+	–
12	Q2	–	Q12	–	Q22	–	Q32	–
13	L1+	–	L2+	–	L3+	–	L4+	–
14	Q1	–	Q11	–	Q21	–	Q31	–
15	L1+	–	L2+	–	L3+	–	L4+	–
16	Q0	–	Q10	–	Q20	–	Q30	–

Allocation of the insulation-displacement connectors (PLC outputs)

Pin	X1
1	0 V
2	Q4
3	Q5
4	Q6
5	Q7
6	Q14
7	Q15
8	Q16
9	Q17
10	–
11	Q23
12	Q22

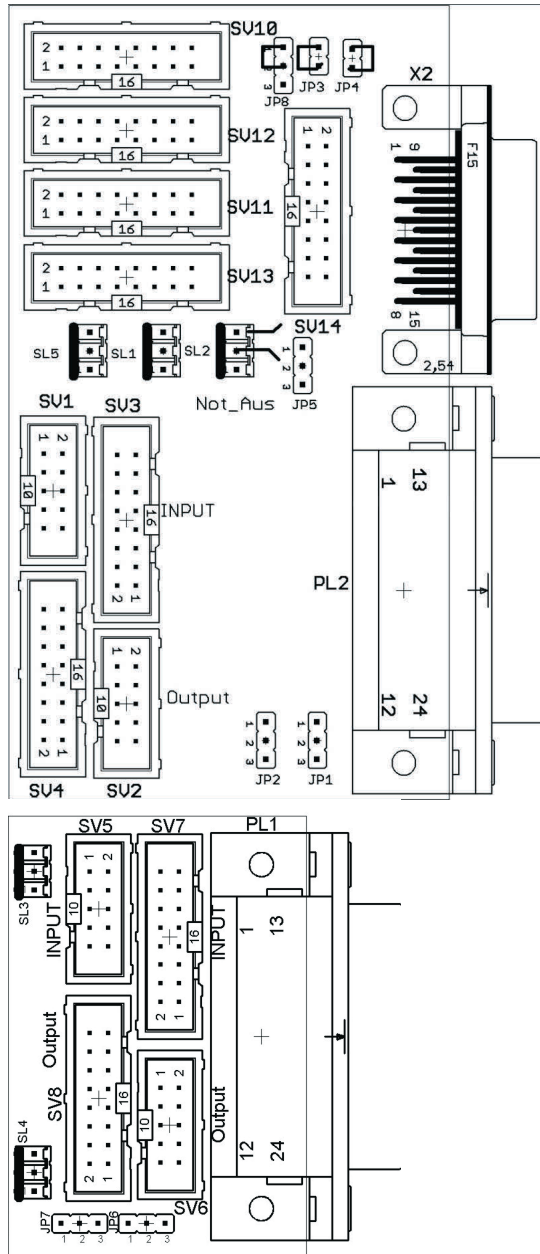
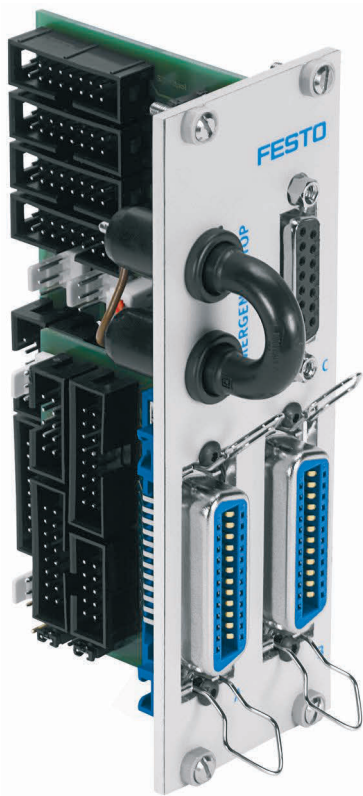
Pin	X1
13	Q21
14	Q20
15	Q33
16	Q32
17	Q31
18	Q30
19	24 V
20	0 V
21	Q3
22	Q2
23	Q1
24	Q0

Pin	X1
25	Q13
26	Q12
27	Q11
28	Q10
29	Q24
30	Q25
31	Q26
32	Q27
33	Q34
34	Q35
35	Q36
36	Q37
37	24 V



Allocation of the 37-pin socket (PLC outputs)

18 19-inch module for SysLink system connector



SV1, SV2, SV5, SV6: 10-pin inputs/outputs
 SV3, SV4, SV7, SV8: 16-pin inputs/outputs
 SV10: Analog I/Os (S7 40-pin top)
 SV11: Analog I/Os (S7 40-pin bottom)
 SV12: Analog I/Os (S7 20-pin top)
 SV13: Analog I/Os (S7 20-pin bottom)
 SV14: Analog I/Os

JP1: PL2 via 24 V or 24 V NA
 JP2: Byte 1 digital outputs via 24 V or 24 V NA
 JP3, JP4: connect GND E and GND A to 0 V (Table 14.4.2)
 JP5: analog outputs via 24 V or 24 V NA
 JP6: PL1 via 24 V or 24 V NA
 JP7: Byte 0 digital outputs via 24 V or 24 V NA
 JP8: connection from emergency off to Bit 1.5
 SL1, SL2, SL3, SL4, SL5: connections for
 24 V DC supply voltage
 X2: analog inputs/outputs
 PL1, PL2: digital inputs/outputs

18.1 Structure and function

The 19" SysLink module expands the scope of functions of your PLC EduTrainer system.

Eight digital 24 V I/Os can be connected to your model (e.g. MPS) with appropriate cables via each of the two Centronics plugs (A and B). A jumper plug makes it possible to deactivate outputs in the event of an emergency stop.

Plugs A and B are configured as follows at the factory:

- A: station (24 V via emergency stop jumper)
- B: operation (24 V continuous)

This configuration can be changed with the help of jumpers JP2 and JP7.

Socket C makes it possible to connect 4 analogue inputs and 2 analogue outputs.

18.2 Commissioning

1. Connect the digital inputs and outputs to the PLC with a flat cable.
 - SV3/SV4 and SV7/SV8: Siemens S7 (16-pin)
 - SV1/SV2 and SV5/SV6: other types of controllers (10-pin)
2. When using modules in parallel, they can be connected by means of a flat cable via the free insulation-displacement connectors SV1 through SV8.
3. Connect the analogue inputs and outputs to the PLC with a flat cable.
 - SV12/SV13: Siemens S7 analogue additional module with 20-pin plug (2 x 16-pin)
 - SV10/SV11: Siemens S7 integrated analogue module with 40-pin plug (2 x 16-pin)
 - SV14: other types of controllers (16-pin)
4. When using modules in parallel, they can be connected by means of a flat cable via the free insulation-displacement connector SV14.
5. Connect the 24 V supply power via 3-pin connector SL1 or SL2.
6. Jumpers JP2, JP5 and JP7 are used to determine whether PLC output modules will be supplied with power directly via 24 V, or via 24 V NA (emergency stop). 24 V NA is deactivated in the event of an emergency stop.
 - Jumper between pins 1 and 2: power supply via 24 V NA
 - Jumper between pins 2 and 3: power supply via 24 V
7. An emergency stop can be initiated with the short-circuit connector (24 V NA is interrupted).
8. Screw the 19" module to the frame.




Jumper JP8 is connected from emergency stop to bit 1.5 for all preferred variants (JP8: pins 1 and 2 connected).

Jumper JP8 is needed when connecting an MPS station to the module. Jumper JP8 must be removed when the module is used for other purposes (JP8: pins 2 and 3 connected).

18.3 Technical data

Electrical/Mechanical	
Operating voltage	24 V DC \pm 3%
Digital inputs/outputs Input voltage Output current	0 V to operating voltage Module: max. 0.5 A per output PLC: see PLC manual
Analog inputs/outputs Input/output voltage Input impedance Output current	0 to 10 V DC and \pm 10 V DC respectively See PLC manual Module: max. 0.5 A per output PLC: see PLC manual
Connection	4 mm safety sockets, SysLink interface, Sub-D socket
Front-plate width	9 HP
Subject to change	

<i>NOTICE</i>	
	<p>The analog connections to 4 mm safety sockets on the 19" module (4AIN/2AOUT) and the analog connections to Sub-D socket C on the 19" module (SysLink system connector) must not be operated in parallel or connected at the same time. This can lead to incorrect signals to human beings and damage to components.</p>

18.4 Contact allocation table

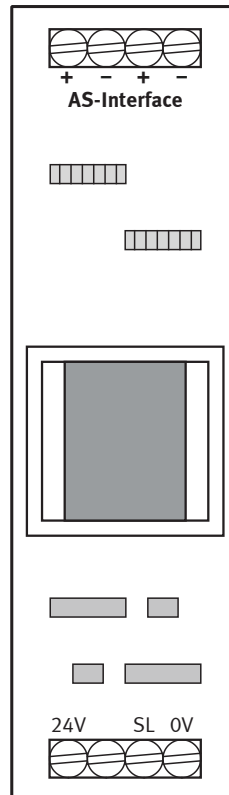
18.4.1 Analogue inputs/outputs

Pin	SV14	SV10	SV13	SV11	SV12	X2
1	UA1	GNDE	0V	GNDA	IE3	UA1
2	IA2	IE3	IA2	IA2	GNDE	UA2
3	UA2	GNDE	0V	GNDA	IE3	GNDA
4	IA1	UE3	GNDA	UA2	UE3	IE2
5	GNDA	GNDE	0V	GNDA	IE3	IE1
6	—	GNDE	UA2	IA1	IE2	GNDE
7	IE2	GNDE	0V	GNDA	IE3	UE2
8	IE4	IE2	IA1	UA1	GNDE	UE1
9	IE1	L3+	UE4	UE4	L3+	IA2
10	IE3	UE2	GNDA	—	UE2	IA1
11	GNDE	L3+	UE4	UE4	L3+	—
12	UE4	GNDE	UA1	—	IE1	IE4
13	UE2	L3+	UE4	UE4	L3+	IE3
14	UE3	IE1	IE4	GNDE	GNDE	UE4
15	UE1	L3+	UE4	UE4	L3+	UE3
16	—	UE1	GNDE	IE4	UE1	—

18.4.2 Digital inputs/outputs

Pin	SV5	SV6	SV7	SV8	PL1	SV1	SV2	SV3	SV4	PL2
1	24V	L2+	0V	0V	Q0	24V_1	L12+	0V_1	0V_1	Q10
2	I0	Q0	I7	Q7	Q1	I10	Q10	I17	Q17	Q11
3	I1	Q1	0V	0V	Q2	I11	Q11	0V_1	0V_1	Q12
4	I2	Q2	I6	Q6	Q3	I12	Q12	I16	Q16	Q13
5	I3	Q3	0V	0V	Q4	I13	Q13	0V_1	0V_1	Q14
6	I4	Q4	I5	Q5	Q5	I14	Q14	I15	Q15	Q15
7	I5	Q5	0V	0V	Q6	I15	Q15	0V_1	0V_1	Q16
8	I6	Q6	I4	Q4	Q7	I16	Q16	I14	Q14	Q17
9	I7	Q7	24V	L2+	L1+	I17	Q17	24V_1	L12+	L11+
10	0V	0V	I3	Q3	L1+	0V_1	0V_1	I13	Q13	L11+
11	–	–	24V	L2+	0V	–	–	24V_1	L12+	0V_1
12	–	–	I2	Q2	0V	–	–	I12	Q12	0V_1
13	–	–	24V	L2+	I0	–	–	24V_1	L12+	I10
14	–	–	I1	Q1	I1	–	–	I11	Q11	I11
15	–	–	24V	L2+	I2	–	–	24V_1	L12+	I12
16	–	–	I0	Q0	I3	–	–	I10	Q10	I13
17	–	–	–	–	I4	–	–	–	–	I14
18	–	–	–	–	I5	–	–	–	–	I15
19	–	–	–	–	I6	–	–	–	–	I16
20	–	–	–	–	I7	–	–	–	–	I17
21	–	–	–	–	24V	–	–	–	–	24V_1
22	–	–	–	–	24V	–	–	–	–	24V_1
23	–	–	–	–	0V	–	–	–	–	0V_1
24	–	–	–	–	0V	–	–	–	–	0V_1

19 19-inch AS-interface module



Screw terminals for 24 V DC supply power (0 V, 24 V) and protective earth conductor
Screw terminals for two ASI strings: ASI-, ASI+

19.1 Design and function

The 19-inch AS-interface module expands the scope of functions of your PLC EduTrainer system. Thanks to its integrated AS-interface filter, and in combination with a corresponding AS-interface controller module, it allows for direct connection of AS-interface components via the two M12 AS-interface sockets.

The module supplies power to the AS-interface controller module and makes the AS-interface connection available externally via two M12 AS-interface sockets.



Use of the 19-inch AS-interface module is only permissible for training purposes.

19.2 Commissioning

1. Connect the 0 V and 24 V screw terminals to the EduTrainer power supply module via the ring cable lugs and wire end sleeves with the help of the blue and red cables.
2. Connect the protective earth screw terminal to the protective earth terminal on the EduTrainer housing with the green-yellow wire (ring cable lug and wire end sleeve).
3. Connect the vacant ASI+ and ASI- screw terminals to the ASI+ and ASI- terminals on the AS-interface controller module via the yellow AS-interface cable (wire end sleeves).
4. Screw the 19-inch module into the frame.

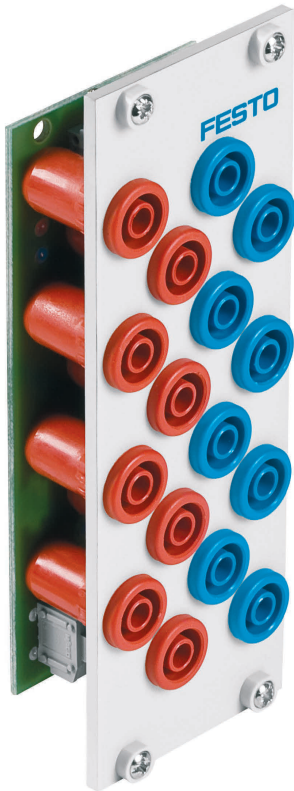
19.3 Technical data

Electrical / mechanical	
Operating voltage	24 V DC \pm 3%
AS-interface voltage	24 V DC \pm 3%
Connection	M12 AS-interface socket
Front panel width	6 HP
Subject to change	

19.4 Pin allocation table

Pin	M12 x 1
1	ASI+
2	
3	ASI-
4	

20 19-inch module 24 V / 0 V



20.1 Design and function

The 19-inch module 24 V / 0 V extends the scope of functions of your PLC EduTrainer system. It's equipped with eight 24 V and eight 0 V outputs laid out as 4 mm safety sockets.

20.2 Commissioning

1. Connect 24 V supply voltage via the single-pole terminal.
2. Connect 0 V supply voltage via the single-pole terminal.
3. Screw the 19" module into the rack.

20.3 Technical data

Electrical/Mechanical	
Operating voltage	24 V DC 0 V DC
Connection	4 mm safety sockets
Front-plate width	9 HP
Subject to change	

21 19-inch module 24 V



21.1 Design and function

The 19-inch module 24 V extends the scope of functions of your PLC EduTrainer system. It's equipped with eight 24 V outputs laid out as 4 mm safety sockets.

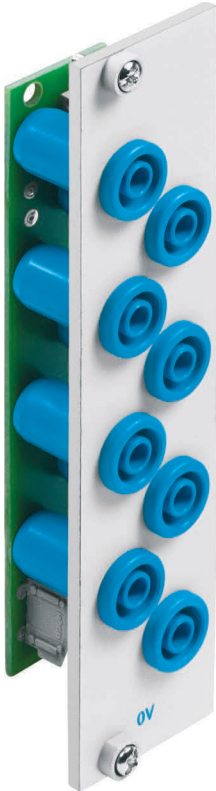
21.2 Commissioning

1. Connect 24 V supply voltage via the single-pole terminal.
2. Screw the 19-inch module into the rack.

21.3 Technical data

Electrical/Mechanical	
Operating voltage	24 V DC $\pm 3\%$
Output current	Max. 4.0 A
Connection	4 mm safety sockets
Front-plate width	9 HP
Subject to change	

22 19-inch module 0 V



22.1 Layout and function

The 19-inch module 0 V extends the scope of functions of your PLC EduTrainer system. It's equipped with eight 0 V outputs laid out as 4 mm safety sockets.

22.2 Commissioning

1. Connect 0 V supply voltage via the single-pole terminal.
2. Screw the 19-inch module into the rack.

22.3 Technical data

Electrical/mechanical specifications	
Operating voltage	0 V DC
Connection	4 mm safety sockets
Front panel width	6 standard width units
Subject to change	

23 19-inch blanking plates




The 19-inch blanking plates are used to cover unused plug-in slots. The blanking plates are available in widths of 3, 6, 9, 12, 18, and 42 HP.

24 Maintenance and care

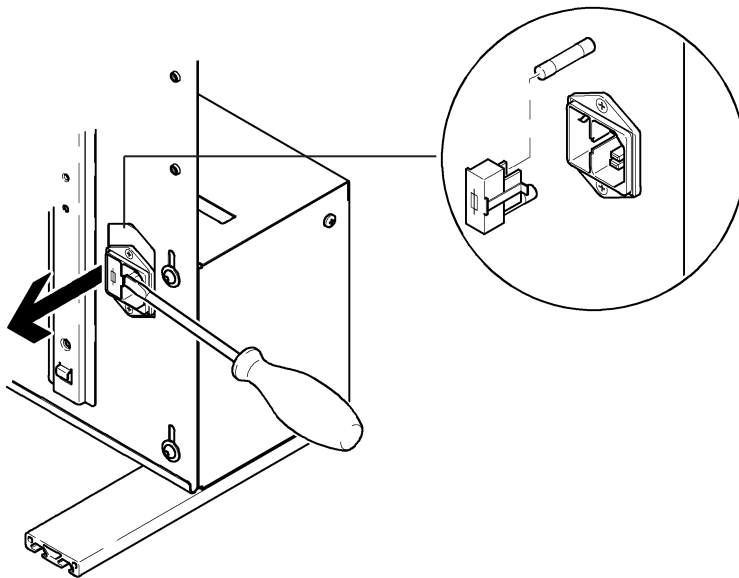
24.1 Cleaning

Clean the housing using a clean, dry cloth if required.

	<p style="text-align: center;">NOTICE</p> <p>Do not use aggressive or abrasive cleaning agents.</p>
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24.2 Changing fuses

1. Open the fuse drawer on the rear of the housing.
2. Replace the defective microfuse with a spare 5x20 mm fuse (3.15 A/250 V/slow-blow).



25 Disposal



Electronic waste contains reusable materials and must not be disposed of with the trash. Bring electronic waste to a designated collection point.

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