

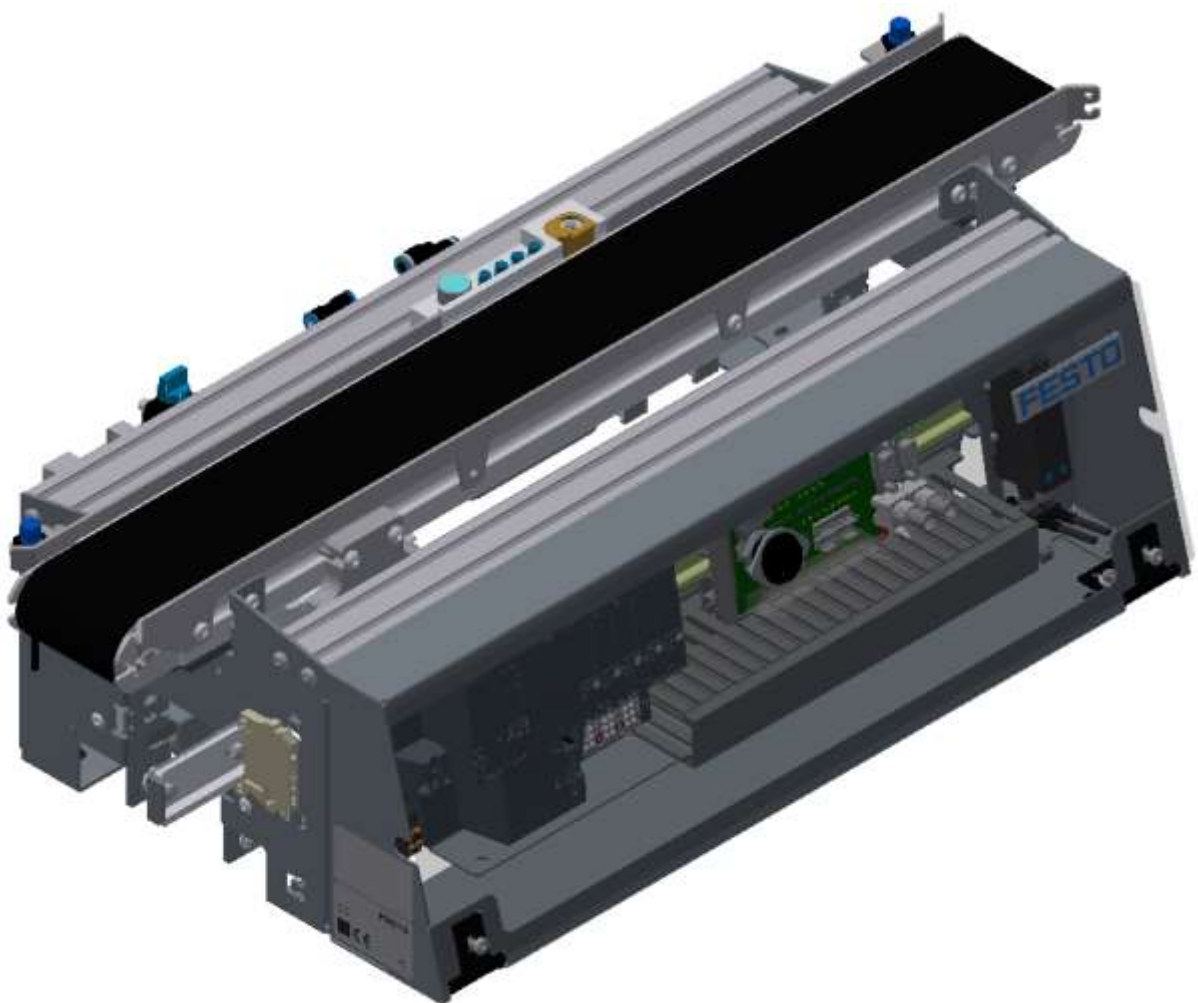
CP Lab conveyor

CP-L-Linear-C[11/13]-M[0/1/6]-V2

FESTO

CP Factory/CP Lab

Original operating
instructions




Festo Didactic

05/2022

CP-L-Linear-C[11/13]-M[0/1/6]

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Original operating instructions

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Where only pronouns such as he and him are used in these operating instructions, these pronouns are of course intended to refer to both male and female persons. The use of a single gender (e.g. he, him) should not be construed as gender discrimination; it is intended solely to make the manual easier to read and the formulations easier to understand.

	<div data-bbox="758 1086 1021 1153"> CAUTION</div> <p>These operating instructions must be available to the user at all times. 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.</p>
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Main document

Associated documents attached:

Safety instructions concerning transport (print/electronic)
Component datasheets (print/electronic)
Circuit diagram (print/electronic)

Contents

1 Safety instructions	6
1.1 Warning notice system	6
1.2 Pictograms	7
1.3 General prerequisites for installing the product.....	8
1.4 General prerequisites for operating the devices	8
2 Intended use	9
3 For your safety	10
3.1 Important information	10
3.2 Qualified persons	11
3.3 Obligations of the operating company	11
3.4 Obligations of the trainees	11
4 Basic safety instructions	12
4.1 General information	12
4.2 Mechanical components	12
4.3 Electrical for general product safety.....	13
4.4 Electrical for general machine safety.....	15
4.5 Pneumatic components.....	18
4.6 Guarantee and liability for application examples	20
4.7 Cyber security	20
4.8 Additional safety instructions	21
4.9 Guarantee and liability	22
4.10 Transport.....	23
4.11 Type code.....	23
4.12 Name plates	24
4.13 CE Declaration of Conformity	25
4.14 General product safety.....	28
4.15 General machine safety.....	28
4.16 Protective devices	29
4.16.1 Panel doors on underground control cabinet	29
4.16.2 Emergency stop.....	29
4.16.3 Additional protective devices	29
5 Technical data.....	30
5.1 Technical data für 24V variants	30
5.2 Technical data for 230 V variants	31
5.3 Technical data for 400 V variants	32
6 Introduction	35
6.1 General information CP Lab system.....	35
6.1.1 Application modules.....	36
6.1.2 Further modules	45
6.2 Resources	47
7 Design and Function	50
7.1 Transport.....	50
7.2 Overview of the System.....	52
7.3 The CP Lab conveyor	53

7.4 Stopper unit	55
7.5 Drive versions.....	60
7.5.1 Gear motor 24 V DC	60
7.5.2 Three-phase asynchronous motor with gearbox and self-ventilation 230 V AC	61
7.5.3 Asynchronous motor with gearbox and self-ventilation 400 V AC	62
7.6 Signal generator.....	63
7.7 Electrical connections	64
7.7.1 Connections without HMi	66
7.7.2 Connections with HMi (option)	67
7.8 Activation motors	68
7.8.1 Motor version 24V	68
7.8.2 Motor version 230V	69
7.8.3 Motor version 400V	70
8 Commissioning	71
8.1 Visual Inspection	71
8.2 Safety Regulations	71
8.3 Workplace	72
8.4 Function extension by application modules	73
8.4.1 Assembly of an CP application module.....	73
8.4.2 Connecting the CP application module electrically to basic module CP Lab Conveyor	76
8.4.3 Pneumatic connection from application modules (option – not available at all application modules)	78
8.5 Electrical Commissioning	79
8.5.1 Modus switch	80
8.5.2 Off Button system.....	81
8.5.3 IN/Outputs	82
8.6 Commissioning.....	84
9 Operation	86
9.1 Starting the station	86
9.2 Menu architecture from operation panel.....	87
9.3 Operation modes	90
9.3.1 Mode	90
9.3.2 Operation mode Reset.....	93
9.3.3 Operation mode Setup	94
9.3.4 Operation mode automatic	107
9.3.5 Main menu - Home	108
9.3.6 Main menu - Setup	113
9.3.7 Main menu – Parameter	113
9.3.8 Main menu – System	116
9.4 Switching on the station.....	124
9.4.1 Start automatic	125
9.4.2 Sequence Description Automatic	129
9.4.3 Process description Cycle End	130
9.5 Operator assistance and simulate application on free AP	131
9.5.1 Generic sequence simulation	132
9.5.2 Operator assistance with display of pictures.....	133
9.5.3 Operator assistance with call of htm-page	135

9.6 HMI extension with G120 frequency converter	136
10 Components	140
10.1 Touch panel CP-L-HMI-T7 (option)	140
10.1.1 Front PCB XZ1	142
10.1.2 Back PCB XZ2	143
10.1.3 SYS link Cable - Interface.....	145
10.1.4 RFID Read/Write system.....	146
10.1.5 IO-Link DA-Interface (digital-analogue interface)	147
10.2 Scalance Ethernet Switch	148
10.2.1 Control systems.....	149
10.2.2 Signal Converter	151
10.2.3 Solenoid valve	153
11 Extensions.....	154
11.1 Extension with an active corner.....	154
11.2 Extension with a passive corner	156
11.3 Robotino docking extension.....	158
12 Message texts and interactive error messages at the HMI	161
12.1 Message texts	161
12.2 Interactive error messages.....	162
12.2.1 Default operation	162
12.2.2 MES Operation	163
12.2.3 General.....	163
13 Spare part list	164
13.1 Electric parts	164
13.2 Pneumatic parts	164
14 Service and cleaning	165
15 Further information and updating	166
16 Disposal	167








1 Safety instructions

1.1 Warning notice system

These operating instructions contain notes that must be observed for your personal safety and in order to prevent property damage. The notes concerning your personal safety are indicated by a safety symbol.

Notes that only concern property damage are not indicated by a safety symbol.

The notes below are listed in order of hazard level.

	<div data-bbox="762 533 1018 600">  DANGER </div> <p>... indicates an imminently hazardous situation that will result in fatal or severe personal injury if not avoided.</p>
	<div data-bbox="751 817 1029 884">  WARNING </div> <p>... indicates a potentially hazardous situation which may result in fatal or severe personal injury if not avoided.</p>
	<div data-bbox="758 1102 1021 1169">  CAUTION </div> <p>... indicates a potentially hazardous situation that may result in moderate or slight personal injury or severe property damage if not avoided.</p>
	<div data-bbox="837 1408 948 1453"> NOTE </div> <p>... indicates a potentially hazardous situation that may result in property damage or loss of function if not avoided.</p>

In cases where more than one hazard level applies, the safety note with the highest hazard level will be shown. A safety note may concern both personal injury and property damage.

Hazards that will only result in property damage are indicated with the word "Note".

1.2 Pictograms

This document and the hardware described in it include warnings concerning possible hazards which may arise if the system is used incorrectly.

The following pictograms are used:



Hazard warning



Warning - dangerous electric voltage



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



Switch off the device and unplug the connection for power supply from the plug socket before commencing installation, repair, maintenance or cleaning work.



Warning – hand injuries



Warning – risk of entanglement



Warning – lifting heavy loads



Electrostatically sensitive devices



Information and/or references to other documentation

1.3 General prerequisites for installing the product

- Festo Didactic products must only be used for the applications specified in their respective operating instructions. Products or components supplied by other manufacturers must only be used if recommended or approved by Festo.
- The products must be transported, stored, installed, assembled, commissioned, operated and maintained properly in order to ensure their safe operation.
- The approved ambient conditions must be observed. The specifications in the relevant operating instructions must be observed.
- The safety equipment must be tested every working day.
- Connecting cables must be checked for damage before each use. In case of damage, they must be replaced.

Connecting cables must correspond to the minimum specifications.

1.4 General prerequisites for operating the devices

General requirements for safe operation of the system:

- In industrial facilities, the national accident prevention regulations must be observed.
- 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 inside the laboratory or the classroom, and at least one outside it.
- The laboratory or classroom must be secured so that the operating voltage and compressed air supply cannot be activated by any unauthorized persons, for example by means of:
 - e.g. a keyswitch
 - e.g. lockable shut off valves
- The laboratory or classroom must be protected by residual current devices (RCDs).
 - RCDs with a differential current of ≤ 30 mA, Type B. When operating machinery with unavoidable leakage current, suitable measures must be implemented and documented in the corresponding workplace risk assessment.
- The laboratory or classroom must be protected by overcurrent protection devices.
 - Fuses or circuit breakers
- Devices must not be used if they are damaged or defective.
 - Damaged devices must be barred 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.
- Safety devices must be checked every working day to ensure that they are fully functional.
- Connecting cables and accessories must be checked for damage before each use.

2 Intended use

Festo Didactic systems and components must only be used:

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

The components and systems are designed in accordance with the latest technology and recognized safety rules. However, life and limb of the user and third parties may be endangered and the components may be impaired if they are used incorrectly.

The Festo Didactic learning system 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 trainees observe the safety precautions described in these operating instructions.

Training with complex machinery is a highly hazardous activity. The operating company must draw up and document a workplace risk assessment. The trainees must be briefed on all the relevant safety aspects before work commences.

Festo Didactic hereby excludes any and all liability for damages suffered by apprentices, 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.

All extensions and accessories must be approved by Festo Didactic, and are only permitted for use for their intended purpose.

The machine fulfils the requirements of the European directives that applied when it was commissioned. Any modification to the machine shall render the manufacturer's CE Declaration of Conformity null and void. The CE Declaration of Conformity must be renewed following each major modification.



3 For your safety

3.1 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 that are applicable at the respective place of use must be adhered to.

	<div data-bbox="751 651 815 707"></div> <div data-bbox="847 667 1027 707">WARNING</div> <ul data-bbox="395 757 1278 786" style="list-style-type: none">• Malfunctions which could impair safety must be eliminated immediately!
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	<div data-bbox="759 900 823 956"></div> <div data-bbox="858 918 1019 958">CAUTION</div> <ul data-bbox="395 1005 1382 1115" style="list-style-type: none">• Improper repairs or modifications may result in unforeseeable operating statuses. Do not carry out any repair or alternation work on components or systems that is not described in these operating instructions.
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3.2 Qualified persons

- The product described in these operating instructions is only permitted for operation by persons who are qualified for the task in question in accordance with the operating instructions, especially the safety instructions.
- Qualified persons are defined as persons whose training and experience enables them to recognize risks and avoid potential dangers when working with this product.

3.3 Obligations of the operating company

It is the responsibility of the operating company to ensure that the station is operated safely.

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

- Are familiar with the basic regulations regarding occupational safety, with the safety instructions, and with the accident prevention regulations, and who have been instructed in the use of the components and systems
- Have read and understood the safety chapter and warnings in these operating instructions
- Are qualified to operate the components and systems in question
- Are governed by and trained in suitable organizational measures to ensure safe training

Personnel should be tested at regular intervals to ensure that they are safety-conscious in their work habits.



3.4 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 occupational safety and accident prevention



4 Basic safety instructions

4.1 General information

	 CAUTION
	<ul style="list-style-type: none"> • Trainees must be supervised by an instructor at all times when working with the components and systems. • Observe the specifications included in the technical data for the individual components, and in particular all the safety instructions! • Wear your personal protective equipment (safety goggles, safety shoes). • Never leave objects lying on the top of protective enclosures. Vibrations could cause such objects to fall off.

4.2 Mechanical components

	 WARNING
	<ul style="list-style-type: none"> • Switch off the power supply! <ul style="list-style-type: none"> – Switch off both the operating power and the control power before commencing work on the circuit. – Never reach into the setup unless it is at a complete standstill. – Be aware of potential overtravel times for the actuators. • Risk of injury during troubleshooting! <ul style="list-style-type: none"> – Use a tool such as a screwdriver for actuating sensors.



	 CAUTION
	<ul style="list-style-type: none"> • Risk of burns due to hot surfaces <ul style="list-style-type: none"> – Devices can reach high temperatures during operation, as a result of which they can cause burns if touched. • Measures to take when maintenance is required. <ul style="list-style-type: none"> – Allow the device to cool off before commencing work. – Use suitable personal protective clothing, e.g. safety safety gloves.



4.3 Electrical for general product safety



Valid for (see chapter type code)

CP-L-LINEAR-C11-M0-V2

CP-L-LINEAR-C13-M0-V2

	 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 datasheets and operating instructions included with the components. – Warning! Capacitors inside the device may still be charged even after being disconnected from all sources of voltage. • Danger due to malfunction <ul style="list-style-type: none"> – Never place or leave liquids (e.g. drinks) on the station in open containers. – The machine must not be switched on if there is condensation (moisture) on its surface. – Never lay pipes/hoses designed to carry liquid media near the machine. • Electric shock due to connection to unsuitable power supply! <ul style="list-style-type: none"> – When devices are connected to an unsuitable power supply, exposed components can cause dangerous electrical voltage that can lead to severe or fatal injury. – Always use power supplies that provide SELV (safety extra-low voltage) or PELV (protective extra-low voltage) output voltages for all the connections and terminals on the electronics modules. • Electric shock when there is no protective grounding in place <ul style="list-style-type: none"> – If there is no protective grounding terminal in place for a Protection Class I device, or if the protective grounding terminal has not been installed correctly, exposed, conductive parts may carry high voltages, thus causing severe or fatal injury if touched. – Ground the device in accordance with the applicable regulations.

	 WARNING
	<ul style="list-style-type: none"> • Risk of fire due to use of unsuitable power supply <ul style="list-style-type: none"> – If a device is connected to an unsuitable power supply, this can cause components to overheat, leading to a breakout of fire. – Always use limited power supplies (LPSs) for all the connections and terminals on the electronics modules.

	 CAUTION
	<ul style="list-style-type: none"> • Always ensure that your connecting cables are designed for use with the electrical connections in question. • When laying connecting cables, make sure they are not kinked, sheared or pinched. Cables laid on the floor must be covered with a cable bridge to protect them. • 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 grounding terminal must always be grounded. <ul style="list-style-type: none"> – If a ground connection (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 disconnected last (after disconnecting the voltage). – Some devices have high leakage current. These devices must be fitted with a grounding conductor for additional grounding. • When replacing fuses, always use specified fuses with the correct current rating and tripping characteristics. • The device is not equipped with a built-in fuse unless otherwise specified in the technical data. • Safe operation of the device is not possible in the event of any of the following circumstances: <ul style="list-style-type: none"> Visible damage Malfunction Inappropriate storage Incorrect transport – Switch off the power supply immediately. • Protect the device to prevent it from being restarted accidentally.

4.4 Electrical for general machine safety



Valid for (see chapter type code)



CP-L-LINEAR-C11-M1-V2



CP-L-LINEAR-C13-M1-V2



CP-L-LINEAR-C11-M6-V2

CP-L-LINEAR-C13-M6-V2



	 DANGER
	<ul style="list-style-type: none"> • Risk of fatal injury in case of interrupted protective grounding conductor! <ul style="list-style-type: none"> – The protective grounding conductor (yellow-green) must not be interrupted, either inside or outside of the device. – The insulation of the protective grounding conductor must never be damaged or removed. • Risk of death from connecting power supply units in series! <p>Contact voltages of greater than 25 V AC or 60 V DC are not permissible. Contact with voltages of greater than 50 V AC or 120 V DC may be fatal.</p> <ul style="list-style-type: none"> – Do not connect power supplies in series. • Risk of death due to electric shock! <p>Protect the outputs of the power supplies (output sockets/terminals) and cables connected to them from direct contact.</p> <ul style="list-style-type: none"> – Always 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 datasheets and operating instructions included with the components. – Warning! Capacitors inside the device may still be charged even after being disconnected from all sources of voltage. • Danger due to malfunction <ul style="list-style-type: none"> – Never place or leave liquids (e.g. drinks) on the station in open containers. – The machine must not be switched on if there is condensation (moisture) on its surface. – Never lay pipes/hoses designed to carry liquid media near the machine. • Electric shock due to connection to unsuitable power supply! <ul style="list-style-type: none"> – When devices are connected to an unsuitable power supply, exposed components can cause dangerous electrical voltage that can lead to severe or fatal injury. – Always use power supplies that provide SELV (safety extra-low voltage) or PELV (protective extra-low voltage) output voltages for all the connections and terminals on the electronics modules. • Electric shock when there is no protective grounding in place <ul style="list-style-type: none"> – If there is no protective grounding terminal in place for a Protection Class I device, or if the protective grounding terminal has not been installed correctly, exposed, conductive parts may carry high voltages, thus causing severe or fatal injury if touched. – Ground the device in accordance with the applicable regulations.

	 WARNING
	<ul style="list-style-type: none"> • Risk of fire due to use of unsuitable power supply <ul style="list-style-type: none"> – If a device is connected to an unsuitable power supply, this can cause components to overheat, leading to a breakout of fire. – Always use limited power supplies (LPSs) for all the connections and terminals on the electronics modules.

	 CAUTION
	<ul style="list-style-type: none"> • Always ensure that your connecting cables are designed for use with the electrical connections in question. • When laying connecting cables, make sure they are not kinked, sheared or pinched. Cables laid on the floor must be covered with a cable bridge to protect them. • 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 grounding terminal must always be grounded. <ul style="list-style-type: none"> – If a ground connection (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 disconnected last (after disconnecting the voltage). – Some devices have high leakage current. These devices must be fitted with a grounding conductor for additional grounding. • When replacing fuses, always use specified fuses with the correct current rating and tripping characteristics. • The device is not equipped with a built-in fuse unless otherwise specified in the technical data. • Safe operation of the device is not possible in the event of any of the following circumstances: <ul style="list-style-type: none"> – Visible damage – Malfunction – Inappropriate storage – Incorrect transport • Switch off the power supply immediately. • Protect the device to prevent it from being restarted accidentally.

4.5 Pneumatic components

	<div style="background-color: #e67e22; color: white; padding: 5px; text-align: center;">  WARNING </div> <ul style="list-style-type: none"> • Depressurize the system! <ul style="list-style-type: none"> – Switch off the compressed air supply before working on the circuit. – Check the system using pressure gauges to make sure that the entire circuit is fully depressurized. – Please note that energy may be stored in reservoirs. Further information on this issue is available in the datasheets and operating instructions included with the components. • Risk of injury when switching on compressed air! Cylinders may advance and retract automatically. • Risk of accident due to advancing cylinders! <ul style="list-style-type: none"> – Always position pneumatic cylinders so that the piston rod's working space is unobstructed along its entire stroke range. – Make sure that the piston rod cannot collide with any of the rigid components in the setup. • Risk of accident due to pneumatic tubing slipping off! <ul style="list-style-type: none"> – Use shortest barbed tubing connectors possible. – If pneumatic tubing slips off, switch off the compressed air supply immediately. • Do not exceed the maximum permissible pressure of 600 kPa (6 bar). • Do not switch on the compressed air until all the barbed tubing connectors have been connected and secured. • Do not disconnect pneumatic tubing while it is under pressure. <ul style="list-style-type: none"> – Do not attempt to seal or plug pneumatic tubing or plug connectors with your hands or fingers. • Check the condition of the condensate in the service unit regularly. If necessary, drain the condensate and dispose of it properly.
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	<div data-bbox="758 197 1023 257"> CAUTION</div> <ul style="list-style-type: none">• Setting up pneumatic circuits<ul style="list-style-type: none">– Connect the devices with plastic tubing with an outside diameter of 4 or 6 mm.– Push the pneumatic tubing into the push-in connector as far as it will go.• Dismantling pneumatic circuits<ul style="list-style-type: none">– Switch off the compressed air supply before dismantling the circuit.– Press the blue release ring down so that the tubing can be pulled out.• Noise due to escaping compressed air<ul style="list-style-type: none">– Noise caused by escaping compressed air may damage your hearing. Reduce noise by using mufflers, or wear hearing protection if the noise cannot be avoided.– All of the exhaust ports on the components included in the equipment set are equipped with mufflers. Do not remove these mufflers.
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4.6 Guarantee and liability for application examples

The application examples are not legally binding, and we cannot guarantee their completeness in terms of their configuration, their equipment or any events that may occur. The application examples are not representations of any specific customer solution; they are merely intended to illustrate typical tasks for which the product in question could be used. You bear the responsibility for ensuring that the products described here are operated properly. These application examples do not in any way relieve you of your responsibility to ensure that the system is handled safely when it is being used, installed, operated or maintained.



4.7 Cyber security

Note

Festo Didactic offers products with industrial security functions that aid the safe operation of plants, systems, machines and networks. In order to protect plants, systems, machines and networks from cyber threats, a comprehensive industrial security concept must be implemented and continuously updated.

Festo's products and services only constitute one part of such a concept.

The customer is responsible for preventing unauthorized access to their plants, systems, machines and networks. Systems, machines and components should only be connected to a company's network or the Internet if and as necessary, and only when the suitable security measures (e.g. firewalls and network segmentation) are in place. Furthermore, Festo's guidelines on suitable security measures should be observed. Festo products and solutions are constantly being developed further in order to make them more secure. Festo strongly recommends that customers install product updates as soon as they become available and always use the latest versions of its products. Any use of product versions that are no longer supported or any failure to install the latest updates may render the customer vulnerable to cyber attacks.

	 WARNING
	<ul style="list-style-type: none"> • Unsecure operating conditions due to software tampering <ul style="list-style-type: none"> – Forms of software tampering (e.g. viruses, Trojans, malware and worms) can lead to unsecure operating conditions in your system, which may in turn lead to severe or fatal injury or property damage. – Keep your software up to date. – Integrate the automation and actuator components into an overarching and comprehensive industrial security concept for the installation or machine in question that is in line with the latest technological developments. – Make sure that all the products you have installed are incorporated into your overarching industrial security concept. – Use suitable measures, such as a virus scanner, to protect files save on exchangeable storage media from malware.

4.8 Additional safety instructions

General requirements for safe operation of the devices:

- Do not lay cables over hot surfaces.
 - Hot surfaces are identified with a corresponding warning symbol.
- Maximum permissible current loads for connector cables and devices must not be exceeded.
 - Always compare the current ratings of the device, the cable and the fuse to ensure that they match.
 - If they do not match, use a separate upstream fuse in order to provide appropriate overcurrent protection.
- Devices with a grounding terminal must always be grounded.
 - If a ground terminal (green-yellow laboratory socket) is available, it must always be connected to protective ground. The protective grounding must always be connected first (before voltage) and disconnected last (after disconnecting the voltage).
- The device is not equipped with a built-in circuit unless otherwise specified in the technical data.

	<div style="text-align: center; background-color: #e67e22; color: white; padding: 5px;">  WARNING </div> <ul style="list-style-type: none"> • This product is designed for use in industrial environments, and may cause malfunctions if used in domestic or small commercial environments.
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4.9 Guarantee and liability


Our General Terms and Conditions of Sale and Delivery shall apply at all times. These shall be made available to the operating company no later than upon conclusion of the sales contract. Guarantee and liability claims resulting from personal injury and/or property damage are excluded if they can be traced back to one or more of the following causes:

- Use of the equipment for purposes other than its intended use
- Improper installation, commissioning, operation or maintenance of the system
- Operation of the system with defective safety equipment, or with improperly attached or non-functional safety equipment and protective guards
- Non-compliance with directions included in the operating instructions with regard to transport, storage, installation, commissioning, operation, maintenance and setup of the system
- Unauthorized modifications to the system
- Improperly executed repairs
- Disasters resulting from the influence of foreign bodies and acts of God
- Dust generated during construction work must be kept away from the system (use coverings).

See the Environmental Requirements section (contamination level) for more details.

4.10 Transport

	<div style="background-color: #d95319; color: white; text-align: center; padding: 5px; margin-bottom: 10px;">  WARNING </div> <ul style="list-style-type: none"> • Danger due to tipping over <ul style="list-style-type: none"> – Suitable packaging and transport equipment must be used when transporting the station. The station can be lifted from underneath using a forklift truck. Please note that eccentric centers of gravity can cause the station to tip over. – Stations with attachments at height will have a high center of gravity. – Take care to avoid tipping over during transportation.
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	<div style="background-color: #005596; color: white; text-align: center; padding: 5px; margin-bottom: 10px;"> NOTE </div> <ul style="list-style-type: none"> • Station contains delicate components! <ul style="list-style-type: none"> – Take care not to shake during transportation • The station is only permitted for installation on solid, non-vibrating surfaces. <ul style="list-style-type: none"> – Make sure that the ground underneath the station has sufficient load-bearing capacity.
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4.11 Type code

Part number	Type code	Controller	Motor
8132970	D:CP-L-LINEAR-C11-M0-V2	Siemens CPU 1512SP-F	DC 24V
8146023	D:CP-L-LINEAR-C13-M0-V2	Siemens IM 155-6 PN HF	DC 24V
On demand	D:CP-L-LINEAR-C11-M1-V2	Siemens CPU 1512SP-F	AC 230V
On demand	D:CP-L-LINEAR-C13-M1-V2	Siemens IM 155-6 PN HF	AC 230V
8146024	D:CP-L-LINEAR-C11-M6-V2	Siemens CPU 1512SP-F	AC 400V
On demand	D:CP-L-LINEAR-C13-M6-V2	Siemens IM 155-6 PN HF	AC 400V

4.12 Name plates



Name plate example

Position	Description
1	Type code
2	Material number
3	Production code
4	Technical data
5	Technical data
6	Technical data
7	Safety note
8	Manufacturer address
9	UK importer address
10	Country of origin
11	Internet address service portal
12	CE Mark
13	UKCA mark
14	Warning mark
15	Symbol read manual
16	WEEE Marking
17	QR Code (Type-and serial number)

(DE) Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller. Der beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union.

(EN) This declaration of conformity is issued under the sole responsibility of the manufacturer. The object of the declaration described is in conformity with the relevant Union harmonisation legislation.

(BG) Настоящата декларация за съответствие е издадена на отговорността на производителя. Предметът на описаната декларация отговаря на съответното законодателство на Съюза за хомонизация.

(CS) Toto prohlášení o shodě se vydává na výhradní odpovědnost výrobce. Popsaný předmět prohlášení je ve shodě s příslušnými harmonizačními právními předpisy Unie.

(DA) Denne overensstemmelseserklæring udstedes på fabrikantens ansvar. Genstanden for erklæringen, som beskrevet, er i overensstemmelse med den relevante EU-harmoniseringslovgivning.

(Ε) Η παρούσα δήλωση συμμόρφωσης εκδίδεται με αποκλειστική ευθύνη του κατασκευαστή. Ο παραινυφόμενος στόχος της δήλωσης είναι σύμφωνος με τη σχετική κανονιστική ρυθμίση και συνεισφέρει.

(ES) La presente declaración de conformidad se expide bajo la exclusiva responsabilidad del fabricante. El objeto de la declaración descrita es conforme con la legislación de armonización pertinente de la Unión.

(ET) Käesolev vastavusdeklaratsioon on välja antud tootja ainuvastutusel. Kirjeldataud deklareeritava toode on kooskõlas asjaomaste liidu õhtustamisaktidega.

(F) Tämä vaatimustenmukaisuusvakuutus on annettu valmistajan yksinomaisella vastuulla. Kuvattu vakuutus on kohde on asiaa koskevan unionin yhdenmukais-tamisalainsäädännön vaatimusten mukainen.

(FR) La présente déclaration de conformité est établie sous la seule responsabilité du fabricant. L'objet décrit de la déclaration est conforme à la législation d'harmonisation de l'Union applicable.

(HU) Ezt a megfelelőségi nyilatkozatot a gyártó kizárólagos felelőssége mellett adják ki. Az ismertetett nyilatkozat tárgya megfelel a vonatkozó uniós harmonizációs jogszabványoknak.

(17) La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del fabbricante. L'oggetto della dichiarazione descritto è conforme alla pertinente normativa di armonizzazione dell'Unione.

(LT) Ši atitiktis deklaracija išduota tik gamintojo atsakomybe. Aprašytas deklaracijos objektas atitinka susijusius derinamuosius Sąjungos teisės aktus.

(IV) Šī atbilstības deklarācija ir izdota vienīgi uz ražotāja atbildību. Aprakstītais deklarācijas objekts atbilst attiecīgajam Savienības saikanošanas tiesību aktam.

(NU) Deze conformiteitsverklaring wordt verstrekt onder volledige verantwoordelijkheid van de fabrikant. Het beschreven voorwerp is in overeenstemming met de desbetreffende harmonisatiewetgeving van de Unie.

(PL) Niniejsza deklaracja zgodności wydana zostaje na wyłączną odpowiedzialność producenta. Wymieniony przedmiot niniejszej deklaracji jest zgodny z odpowiednimi wymaganiami unijnego prawodawstwa harmonizacyjnego.

(PT) A presente declaração de conformidade é emitida sob a exclusiva responsabilidade do fabricante. O objeto da declaração descrito está em conformidade com a legislação aplicável de harmonização da União.

(RO) Prezența declarației de conformitate este emisă pe răspunderea exclusivă a producătorului. Obiectul descris al declarației este în conformitate cu legislația relevantă de armonizare a Uniunii.

(SK) Toto vyhlásenie o zhode sa vydáva na vlastnú zodpovednosť výrobcu. Uvedený predmet vyhlásenia zhode s príslušnými harmonizačnými právnymi predpismi.

(51) Za izdajo te izjave o skladnosti je odgovoren izključno proizvajalec. Opisani predmet izjave je v skladu z ustrežno zakonodajo Unije o harmonizaciji.

(SV) Denna försäkras om överensstämmelse utfärdas på tillverkarens eget ansvar. Föremålet för försäkras överensstämmer med den relevanta harmoniserade unionslagstiftningen.

(TR) Bu Uygunluk Belgesi tamamen Greticinin sorumluluğu altındadır. Belgede açıklanan obje, Birliğin ilgili uyum mevzuatına uygundur.

EG-Konformitätserklärung

EU Declaration of Conformity

Декларация за съответствие на ЕС

Prohibiční a šedé ES

EF-overensstemmelseserklæring

အသက် ၁၀ နှစ်အောက် ကလေးများ

Declaración de conformidad CE

E) vastavuse deklaratsioon

EY-zaatimuster mukaisi usakurufu

Déclaration CE de conformité

EK megfélelősségi politikáját

Dichiarazione di conformità EUT

ED activities delinquent

EK atbilstības deklarācija

EG-verklaring van

over new systems and new

Deklaracja zgodności WE

Declaração de conformidade CE

Declaratie de conformitate CE

Wahlserie n rhode ES

Izjava ES o skladnosti

EG-Fürsorge im Überwachungsmaß

The installation instructions according to the manual have to be followed. The person authorized to compile the technical documents is Philippe Drolet, Product conformity, Festo Didactic Ltée/Ltd. Canada.

FESTO

2022-03-02

8032510	CP-AM-DRILL
8032507	CP-AM-PRESS
8032508	CP-AM-MAG
8032509	CP-AM-TURNOVER
8032511	CP-AM-CAM
8038567	CP-AM-MPRESS
8043598	CP-AM-IDRILL-C21
8050101*	CP-L-LINEAR-C11-M0
8050102*	CP-L-LINEAR-C13-M0
8058667*	CP-L-BRANCH-C21
8061184	CP-AM-OUT
8068413	CP-AM-iPICK-C21
8088783	CP-AM-OVEN-230V
8091107	CP Lab HMI Panel
8092833*	SC CP LAB STD CFG 4
8092834*	SC CP LAB STD CFG 6
8092835*	SC CP LAB STD CFG 8
8092836*	SC CP LAB STD CFG 10
8108237*	CP-L-LINEAR-C11-M6
8129428	CP-Lab/MPS HMI Panel
8132970*	CP-L-LINEAR-C11-M0-V2
8146023*	CP-L-LINEAR-C13-M0-V2
8146024*	CP-L-LINEAR-C11-M6-V2
8152450	CP-AM-LABEL-V2
8154245	CP-AM-MEASURE-V2
8155207	CP-AM-CAM-V2
8167762*	CP-L-LINEAR-C11-M0 V2
8167762*	CP-L-LINEAR-C11-M0 V2
8167764*	CP-L-LINEAR-C11-M6 V2
8172797*	CP-L-LINEAR-NO-PLC-M0

2006/42/EC	EN 60204-1:2018
2014/30/EU	EN 61326-1:2013-01
2011/65/EU	EN 63000:2016-10
2014/53/EU*	See Appendix A for details

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8101137 – DoC0039

FESTO

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Canada
www.festo-didactic.com

Francis Larrivée
Francis Larrivée, ing.
Engineering

Philippe Drolet
Philippe Drolet, ing.
Product Compliance

Appendix A:

Extracted from: Siemens EU-Declaration of Conformity No. A5E50679864A; REV.: 001 /
[CE-DoC_A5E50679864A_RF200R_RF300R_RED_RoHS_2020-12-11.pdf \(siemens.com\)](#)

SIEMENS

Anhang RED & RoHS / Annex RED & RoHS zur EU-Konformitätserklärung / to EU-Declaration of Conformity

Nr./No. A5E50679864A; REV.: 001

Produktgruppenbezeichnung/-modell SIMATIC RF200R / RF300R HF RFID READERS
Product group identification/-model (13.56 MHz)

Die Übereinstimmung der bezeichneten Produkte (unter Verwendung des Zubehörs) des oben genannten Gegenstandes mit den Vorschriften der angewandten Richtlinie(n) wird nachgewiesen durch die vollständige Einhaltung folgender Normen / Vorschriften (variantenabhängig, siehe Anhang Produkte - Tabelle 1. Angewandte Normen werden durch ein „x“ gekennzeichnet, wofür gegebenenfalls nicht angewandte Normen durch ein „-“ gekennzeichnet werden.)

The conformity of the designated products (using the accessory) of the object described above with the provisions of the applied Directive(s) is proved by full compliance with the following standards / regulations (depending on versions, see annex Products - Table 1. Applicable Standards are marked by a "x" whereas not applicable Standards are marked by a "-").

Art. 3(1) a) Schutz der Gesundheit und Sicherheit - Normen / Health and Safety - standards:

Referenznummer Reference number	Ausgabedatum Date of issue	Referenznummer Reference number	Ausgabedatum Date of issue
EN 60954 - A1	2014/03/17	EN 60954	2018

Art. 3(1) b) EMV Normen / EMC standards:

Referenznummer Reference number	Ausgabedatum Date of issue	Referenznummer Reference number	Ausgabedatum Date of issue
ETSI EN 301 489-1	V2.2.3	EN IEC 61000-6-1	2019
ETSI EN 301 489-3	V2.1.1	EN IEC 61000-6-2	2019
EN 50119 - A1 - A11	2016/02/17/2020	EN 61000-6-2 - A1	2007/2011
EN 50322 - A11 Class A/B	2015/03/26	EN IEC 61000-6-4	2019
EN 50320 - A11	2011/03/25	EN IEC 61000-6-3	2020

Art. 3(2) Effiziente Nutzung des Frequenzspektrums Harmonisierte Normen / Efficient usage of spectrum Harmonized standards:

Referenznummer Reference number	Ausgabedatum Date of issue	Referenznummer Reference number	Ausgabedatum Date of issue
ETSI EN 300 330	V2.1.1		

Art. 3(3) a) i) Delegierte Rechtsakte für Funkanlagen / Delegated acts for Radio equipment

Referenznummer Reference number	Ausgabedatum Date of issue	Referenznummer Reference number	Ausgabedatum Date of issue

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8101137 – DoC0039

4.14 General product safety

Valid for (see chapter type code)

CP-L-LINEAR-C11-M0-V2

CP-L-LINEAR-C13-M0-V2

	 WARNING
	<ul style="list-style-type: none"> • General product safety, CE conformity <ul style="list-style-type: none"> – Product safety for the CP-Lab conveyor was evaluated as part of a risk assessment. – As a consequence of Changes (hardware / software) Additions or improper use – Product safety can no longer be guaranteed by the operator. – In this case, the manufacturer's CE declaration of conformity expires. The operator must re-evaluate the safety and determine the CE conformity.

4.15 General machine safety



Valid for (see chapter type code)

CP-L-LINEAR-C11-M1-V2

CP-L-LINEAR-C13-M1-V2



CP-L-LINEAR-C11-M6-V2

CP-L-LINEAR-C13-M6-V2

	 WARNING
	<ul style="list-style-type: none"> • General machine safety, CE conformity <ul style="list-style-type: none"> – The individual modules of this system contain control programs for which the safety of the machine has been evaluated. – The safety-related parameters and checksums of the safety function are listed in the operating instructions for the respective stations. – Changes to programs may impair the safety of the machine. A modified control program may constitute a major change to the machine. – In such cases, the manufacturer's CE Declaration of Conformity shall be rendered null and void. The operating company will need to re-evaluate the safety of the machine and confirm its CE conformity.

4.16 Protective devices

In order to reduce risks, this machine contains guards to prevent access to dangerous areas. These guards must not be removed or tampered with.

	 WARNING
	<ul style="list-style-type: none"> • Damage to the safety window <ul style="list-style-type: none"> – Windows must not be cleaned using aggressive or alcoholic cleaning agents. Risk of brittleness and breakage! – This protective device must be replaced if it shows any signs of damage. Please contact our Service department to arrange this.

4.16.1 Panel doors on underground control cabinet

Transparent, impact-resistant, polycarbonate plate with lock.

Can only be accessed with tool (control cabinet key); tool must be kept in a secure place!

Access reserved for qualified electricians.

The safety door is not monitored! Make sure the safety door is always closed.

4.16.2 Emergency stop

If a station has an emergency stop button, the emergency stop signal switches off all actuators. An acknowledgment by the operator is required for a restart, there is no automatic restart.

4.16.3 Additional protective devices

The individual components, such as the power supplies and the controllers, possess built-in safety functions such as short-circuit protection, overcurrent protection, overvoltage protection and thermal monitoring. If necessary, consult the instruction manual for the device in question for more information.

5 Technical data

5.1 Technical data für 24V variants

Valid for (see chapter type code)

CP-L-LINEAR-C11-M0-V2

CP-L-LINEAR-C13-M0-V2

Parameter	Value
Electrics	
Power supply	24 V DC, 4.5 A safety low voltage (PELV)
Ambient conditions	
Operating environment	Use inside building only
Ambient temperature	5°C ... 40°C
Rel. air humidity	80% up to 31°C
Pollution degree	2, Dry, non-conductive contamination
Operating height	Up to 2000 m above NN (sea level)
Noise emission level	$L_{pA} < 70$ dB
Certification	
CE marking in accordance with:	Machinery Directive EMC Directive RoHS Directive
EMC environment	Industrial environment, Class A (in acc. with EN 55011)
Measurements	
Length	810 mm
Width	415 mm
Height	289 mm
Weight	Ca. 35 kg
Subject to change	

5.2 Technical data for 230 V variants

Valid for (see chapter type code)

CP-L-LINEAR-C11-M1-V2

CP-L-LINEAR-C13-M1-V2

Parameter	Value
Electrics	
Operating voltage	1-phase 230 V AC \pm 10%, 50 Hz
Power supply system	TNC-S, mains conductor L1, neutral conductor N, protective grounding PE
Full load power	1 A
Control voltage, Voltage for small actuators	24 V DC Protective extra-low voltage (PELV)
Power supply connection	IEC 60309, CEE 16 A
Max. backup fuse for installation	16 A
Leakage current	\leq 18 mA
Connecting cable between stations	System plug
Protection class	I, Operation with protective grounding only. Second protective grounding conductor required due to high leakage current
Overvoltage category	CAT II, Operation in building installation only
Short circuit current rating (SCCR)	10 kA
Compressed air	
Supply pressure	6 bar, 90 psi
Supply rate	\geq 40 l/min
Compressed air quality	EN ISO 8573-1
Pressure dew point (Class 4)	\leq +3°C
Ambient conditions	
Operating environment	Use inside building only
Ambient temperature	5°C ... 40°C
Rel. air humidity	80% up to 31°C
Pollution degree	2, Dry, non-conductive contamination
Operating height	Up to 2000 m above NN (sea level)
Noise emission level	$L_{pA} < 70$ dB
Certification	
CE marking in accordance with:	Machinery Directive EMC Directive RoHS Directive
EMC environment	Industrial environment, Class A (in acc. with EN 55011)
Subject to change	

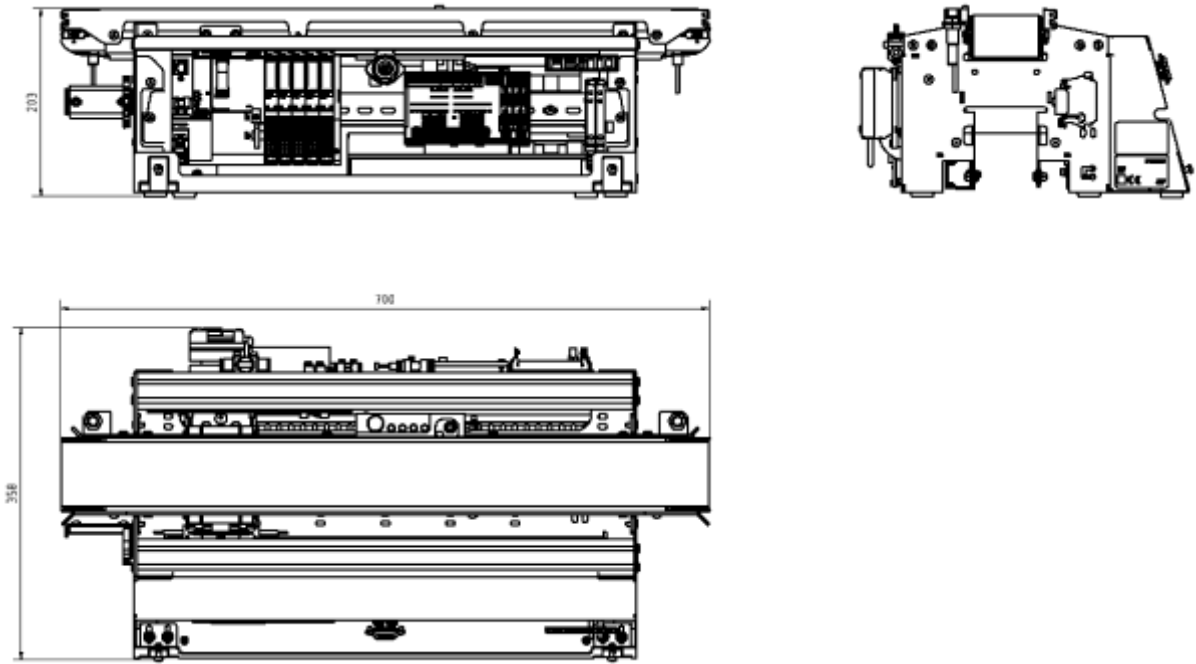
5.3 Technical data for 400 V variants

Valid for (see chapter type code)

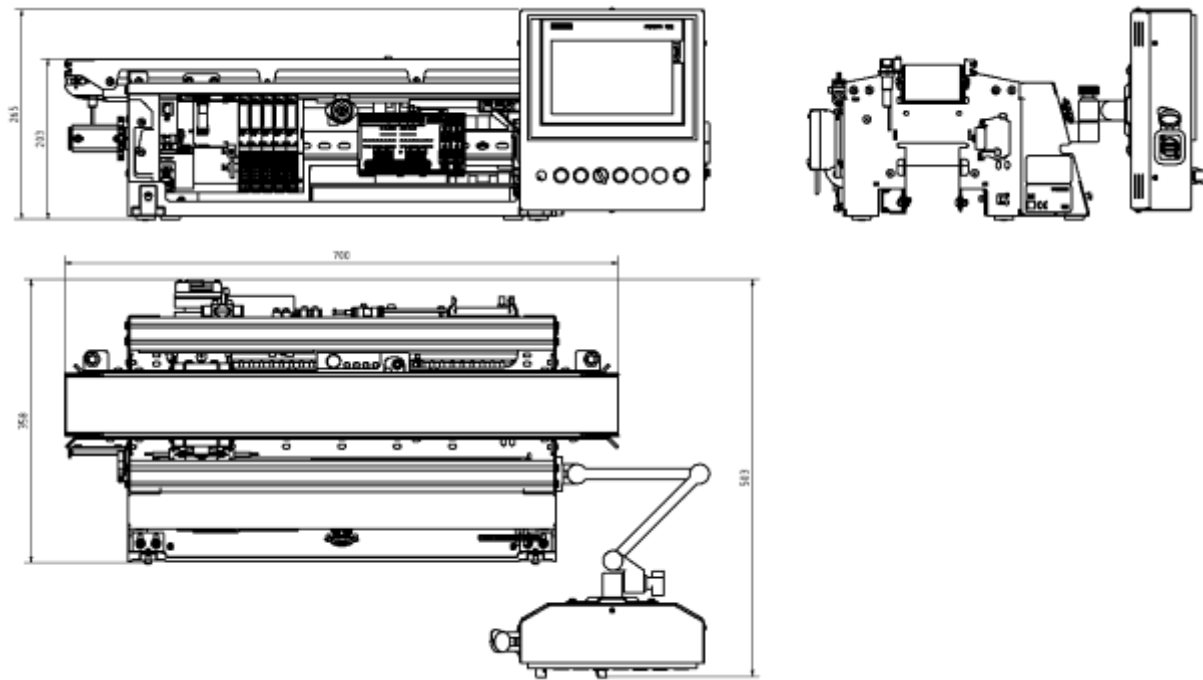
CP-L-LINEAR-C11-M6-V2

CP-L-LINEAR-C13-M6-V2

Parameter	Value
Electrics	
Operating voltage	3-phase 400 V AC±10%, 50 Hz
Power supply system	TNC-S, mains conductor L1, L2, L3, neutral conductor N, protective grounding PE
Full load power	1 A
Control voltage, Voltage for small actuators	24 V DC Protective extra-low voltage (PELV)
Power supply connection	IEC 60309, CEE 16 A
Max. backup fuse for installation	16 A
Leakage current	≤ 18 mA
Connecting cable between stations	System plug
Protection class	I, Operation with protective grounding only. Second protective grounding conductor required due to high leakage current
Overvoltage category	CAT II, Operation in building installation only
Short circuit current rating (SCCR)	10 kA
Compressed air	
Supply pressure	6 bar, 90 psi
Supply rate	≥ 40 l/min
Compressed air quality	EN ISO 8573-1
Pressure dew point (Class 4)	≤ +3°C
Ambient conditions	
Operating environment	Use inside building only
Ambient temperature	5°C ... 40°C
Rel. air humidity	80% up to 31°C
Pollution degree	2, Dry, non-conductive contamination
Operating height	Up to 2000 m above NN (sea level)
Noise emission level	L _{pA} < 70 dB
Certification	
CE marking in accordance with:	Machinery Directive EMC Directive RoHS Directive
EMC environment	Industrial environment, Class A (in acc. with EN 55011)
Subject to change	



Without HMI / Illustration similar



With HMI (option) / Illustration similar

6 Introduction

6.1 General information CP Lab system

The Festo Didactic Learning System is designed to meet a number of different training and vocational requirements. The CP Lab conveyor and the application modules of the system enable training and further education geared to operational reality. The hardware consists of didactically prepared industrial components.

The stations provide an appropriate system for practice-orientated education/classes of the following key qualifications

- Social competence,
- Technical competence and
- Method competence

Moreover, training can be provided to instil team spirit, willingness to cooperate and organizational skills. Actual project phases can be taught by means of training projects, such as:

- Planning,
- Assembly,
- Programming,
- Commissioning,
- Operation,
- Maintenance
- Fault finding and
- Trouble shooting.

This manual describes the handling of the CP Lab conveyor and the application modules. All necessary operations for operation are explained and described. In some cases, the facts are explained with the aid of graphics or pictures, which thus serve to facilitate communication.

The CP Lab system is developed for all apprentices who want to move something. It doesn't matter if the education is for electro- or metal profession, for mechatronics, technician- or engineer education.

Concept

During technical lessons for pupils we use our simple models with O-ring drive. In the CP Lab system the material flow is realized with a common industrial belt. In industrial, automated production, special belts are essential part of the production system. Products with different measurements are transported on belts with different widths or on double belts.

Transfer system with modules

The transfer system is a modular system which consists of two essential components. First the CP Lab conveyor which can be equipped with different drive concepts and second the constitutive modules for topics like sensors, electrical positioning, handling, assembling, camera inspection, barcode scanning, RFID and many others.

6.1.1 Application modules

- CP application module output
For removing workpieces from the system
Complexity medium, electro pneumatic module

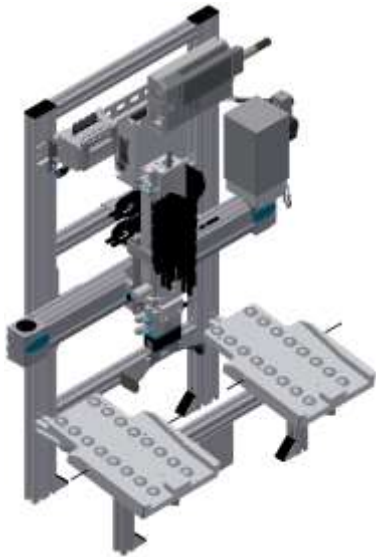


Illustration similar

- CP application module drilling
For drilling housing parts
Complexity simple, electro pneumatic module

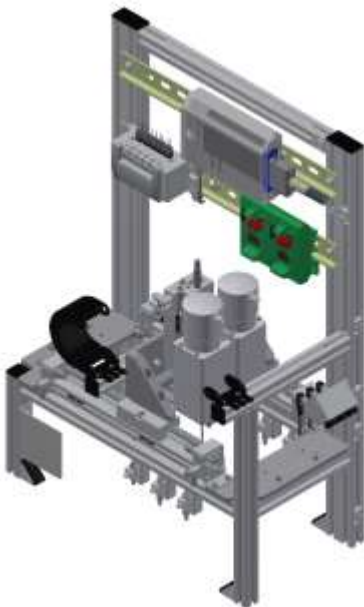


Illustration similar

- CP Factory cobot station
for assembly of various workpieces / with the help of a worker or without
High complexity, industrial, collaborative 6-axis robot



Illustration similar

- CP application module dispensing
to distribute balls in three different colors and diameters
Complexity high, electro pneumatic module

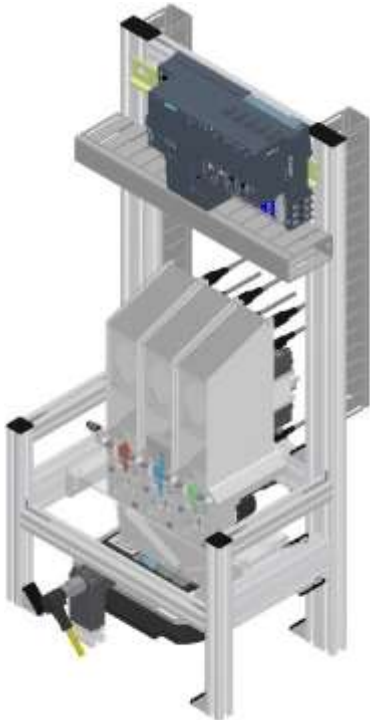


Illustration similar

- CP application module labeling
In order to label workpieces with a label
Complexity high, electro pneumatic module

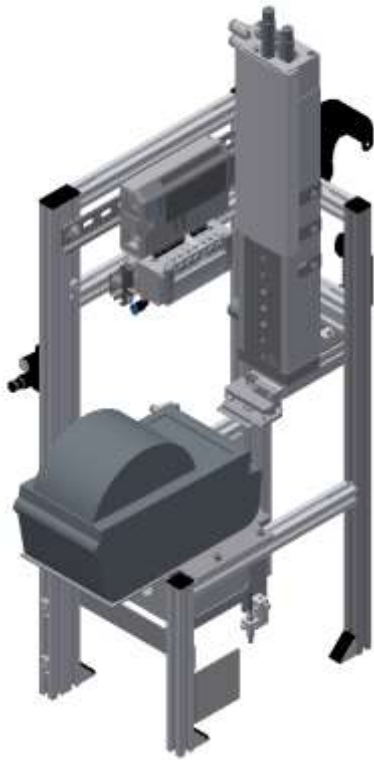


Illustration similar

- CP application module manual work
For the manual processing of pallets and / or workpieces on a stopper
Complexity simple, software module



Illustration similar

- CP application module ASRS for workpieces
for loading / unloading workpieces
Complexity high, 2 toothed belt axes

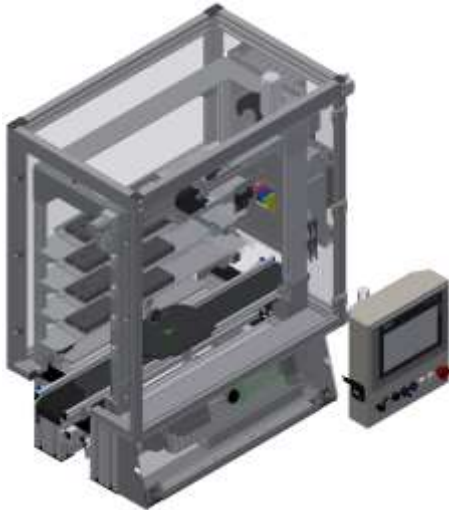


Illustration similar

- CP application module ASRS for workpieces
for loading / unloading workpieces
Complexity high, 2 toothed belt axes



illustration similar

- CP application module iDrilling
For drilling housing parts
Complexity simple, electro-pneumatic module with controller with web interface for cyber-physical system

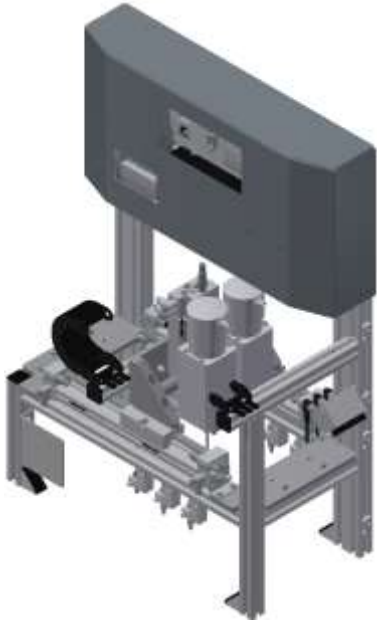


Illustration similar

- CP application module Camera inspection
With camera for checking object properties
Complexity high, Festo Camera system with evaluation software

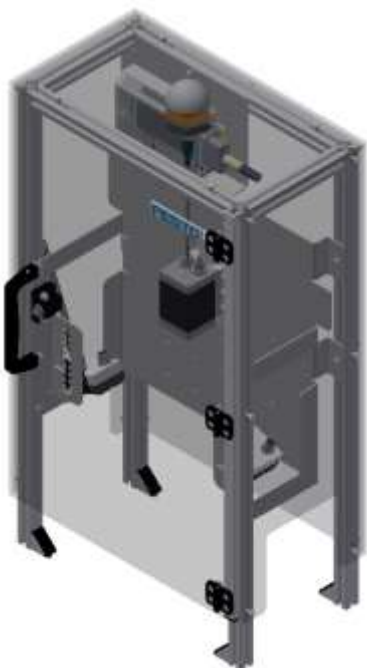


illustration similar

- CP application module magazine
For feeding housing parts. Different in the magazine rear cover and magazine front cover
Complexity simple, electro pneumatic module

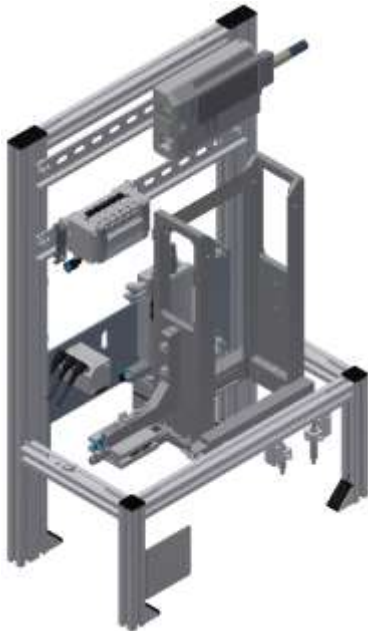


Illustration similar

- CP application module Measuring
For quality assurance
Complexity high, processing of analog input signals

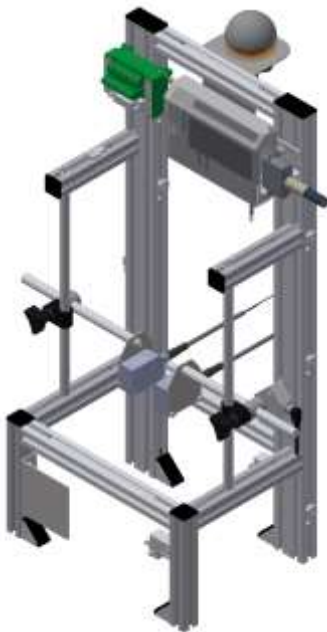


Illustration similar

- CP application module Muscle press
For pressing the housing parts
Complexity simple, electro pneumatic module (pneumatic muscle)

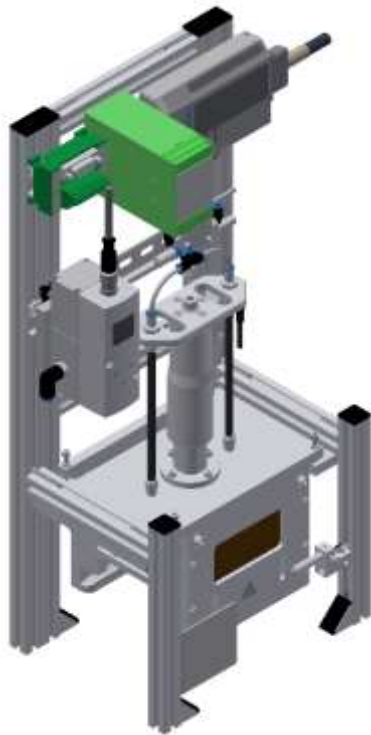


Illustration similar

- CP application module Pick by light
Hand workplace where workpieces are provided for assembly.
Complexity, electrical module



Illustration similar

- CP application module press
For pressing the housing parts
Complexity simple, electro pneumatic module

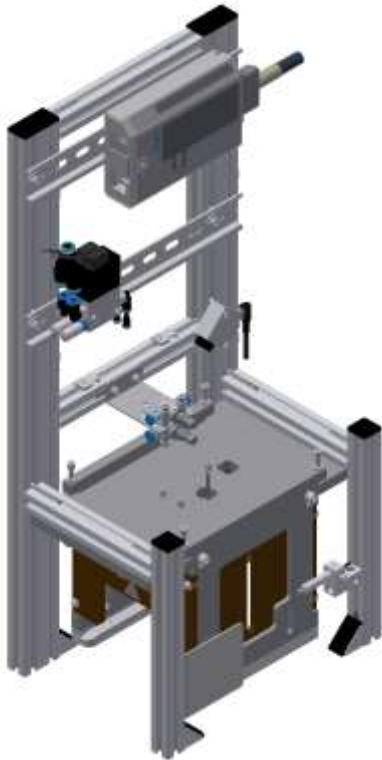


Illustration similar

- CP application module heat tunnel
For heating workpieces for thermal processing
Complexity medium to high, control engineering module with analog processing and PWM



Illustration similar

- CP application module turn over
For turning workpieces
Complexity medium, electro pneumatic module



Illustration similar

6.1.2 Further modules

- Mobil robot Robotino® for workpiece carriers
The AGV system is used for the transport of workpieces.



Illustration similar

- CP Lab Bridge
The task of the CP Lab Bridge is to turn off workpiece carriers with and without workpieces on CP Factory Modules or a Robotino. In addition, workpiece carriers from CP Factory modules or from a Robotino can be imported into the CP Lab system.

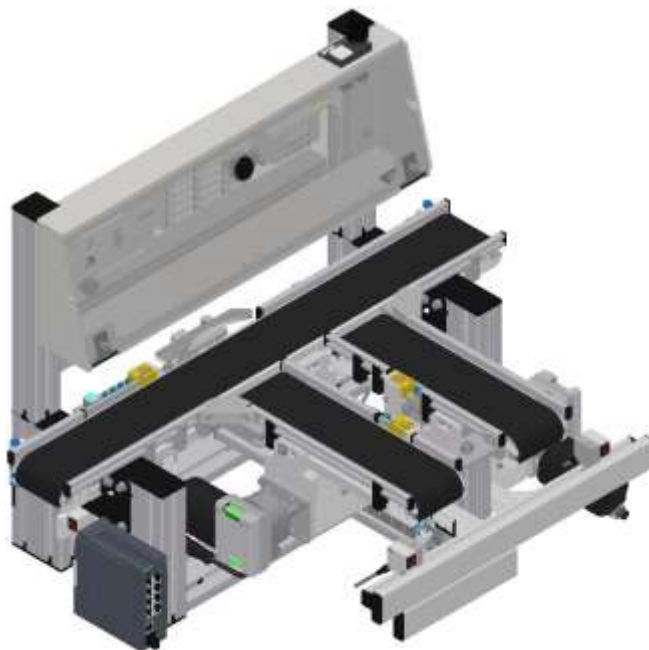


Illustration similar

- MSRS20

The application module MSRS20 is designed to store goods coming from a robotino. The operation is done with an iPad, a worker is handling the boxes with the goods manually.



Illustration similar

6.2 Resources

The training equipment of the system consists of several resources. They are used depending on the process selection.

The following resources are available:



Pallet carrier / illustration similar

These pallet carriers are available for transporting the pallets.

Partnumber in MES - 31








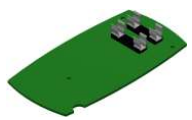









Pallet / illustration similar

These pallets are available for receiving always one workpiece.

Partnumber in MES - 25

Workpieces



The workpieces are differentiated according to the project into production parts and external production parts.



Workpieces	Description	Workpieces	Description
	CP raw material black No. 101		CP back cover blue No. 113
	CP raw material grey No. 102		CP back cover red No. 114
	CP raw material blue No. 103		CP – board No. 120
	CP raw material red No. 103		CP fuse No. 130
	CP front cover red No. 107		CP front cover black No. 210 – if there is a CNC milling machine integrated in the system, the front cover can also be produced there , thus becoming a production part.
	CP front cover blue No. 108		CP front cover black without fuses No. 211
	CP front cover grey No. 109		CP front cover black with fuse left No. 212
	CP front cover black No. 110		CP front cover black with fuse right No. 213
	CP back cover black No. 111		CP front cover black with both fuses No. 214
	CP back cover grey No. 112		



Workpieces	Description	Workpieces	Description
	CP front cover grey No. 310 – if there is a CNC milling machine integrated in the system, the front cover can also be produced there , thus becoming a production part.		CP front cover red No. 510 – if there is a CNC milling machine integrated in the system, the front cover can also be produced there , thus becoming a production part.
	CP front cover grey without fuses No. 311		CP front cover red without fuses No. 511
	CP front cover grey with fuse left No. 312		CP front cover red with fuse left No. 512
	CP front cover grey with fuse right No. 313		CP front cover red with fuse right No. 513
	CP front cover grey with both fuses No. 314		CP front cover red with both fuses No. 514
	CP front cover blue No. 410 – if there is a CNC milling machine integrated in the system, the front cover can also be produced there , thus becoming a production part.		CP black complete without board No. 1200
	CP front cover blue without fuses No. 411		CP part customer No. 1210 freely selectable
	CP front cover blue with fuse left No. 412		CP part black with no fuse No. 1211
	CP front cover blue with fuse right No. 413		CP part black with fuse on the left No. 1212
	CP front cover blue with both fuses No. 414		CP part black with fuse on the right No. 1213
			CP part black with both fuses No. 1214


7 Design and Function

7.1 Transport

	<div style="background-color: #d95319; color: white; text-align: center; padding: 5px;">  WARNING </div> <ul style="list-style-type: none"> • Damage to transport equipment when moving heavy machines/machine sections <ul style="list-style-type: none"> – When the stations are shipped out, extra care must be taken to ensure that heavy machines/machine sections are always transported using a suitable fork-lift truck. A single station can weigh up to 50 kg. – Always use suitable transport equipment. – Always use the lifting points provided to move the machine/machine sections. – Always use the designated load take-up point.
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	<div style="background-color: #d95319; color: white; text-align: center; padding: 5px;">  WARNING </div> <ul style="list-style-type: none"> • Securing transit routes <ul style="list-style-type: none"> – The supply routes must be cleared prior to transport, and must be suitable for the forklift truck to pass through. If necessary, warning signs or barrier tape must be set up to keep the routes clear. • Caution <ul style="list-style-type: none"> – When opening transport boxes, care must be taken to ensure that any additional components delivered in the same box, such as computers, do not fall out.
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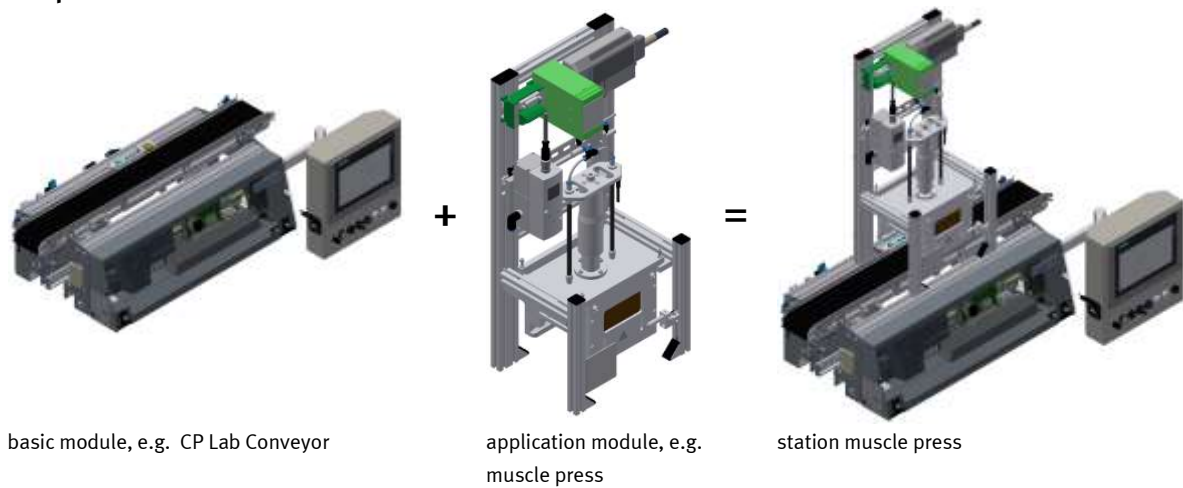
	<div style="background-color: #d95319; color: white; text-align: center; padding: 5px;">  WARNING </div> <ul style="list-style-type: none"> • Danger of crushing for hands/feet <ul style="list-style-type: none"> – It is not permitted to grip onto or under the feet when handling the machine, as there is an increased risk of hands or feet getting crushed or trapped in these areas. – When setting down the station, make sure no persons have their feet under the machine's feet.
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	<i>NOTE</i>
	<ul style="list-style-type: none">– When opening the transport box, any additional components must be secured to prevent them from falling out, and removed first.– Once this is done, the transport box can be removed/opened up fully, and the station can be taken out and moved to its intended location.– Care must be taken with all components projecting from the machine, as sensors and similar small parts can easily be damaged if the machine is not transported correctly.– Check that all the profile connectors are seated correctly using a size 4 – 6 Allen key. Unavoidable vibrations can loosen the connectors during transport.

7.2 Overview of the System

CP Lab Conveyor, CP Factory Linear, CP Factory Shunt and CP Factory Bypass are called basic modules. If an application module, e.g. the CP Application Module muscle press is attached to a basic module, it becomes a station.

Example

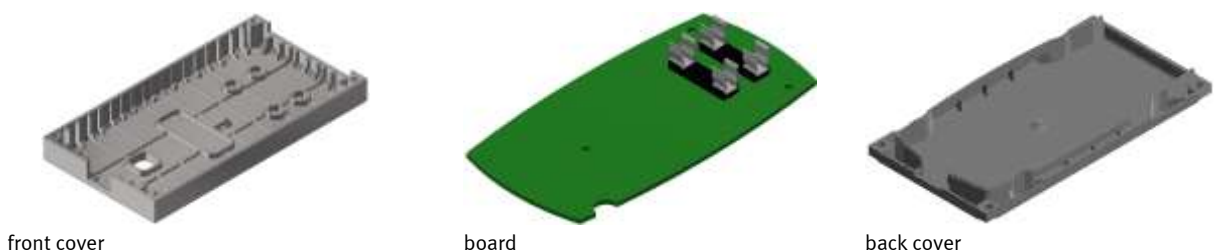


If several stations are put in a row one behind the other, this will form a production line.



Carriers are transported on the conveyors of the basic modules. And on the carriers, there are pallets with a fixed workpiece reception placed. The workpieces are placed on the workpiece reception or taken from it. Pallets can also be placed on a carrier in some stations or gripped from there.

The typical workpiece of a CP Factory/Lab System is the roughly simplified version of a mobile phone. The workpiece consists of a front cover, of a back cover, of a board and of a maximum of two fuses.

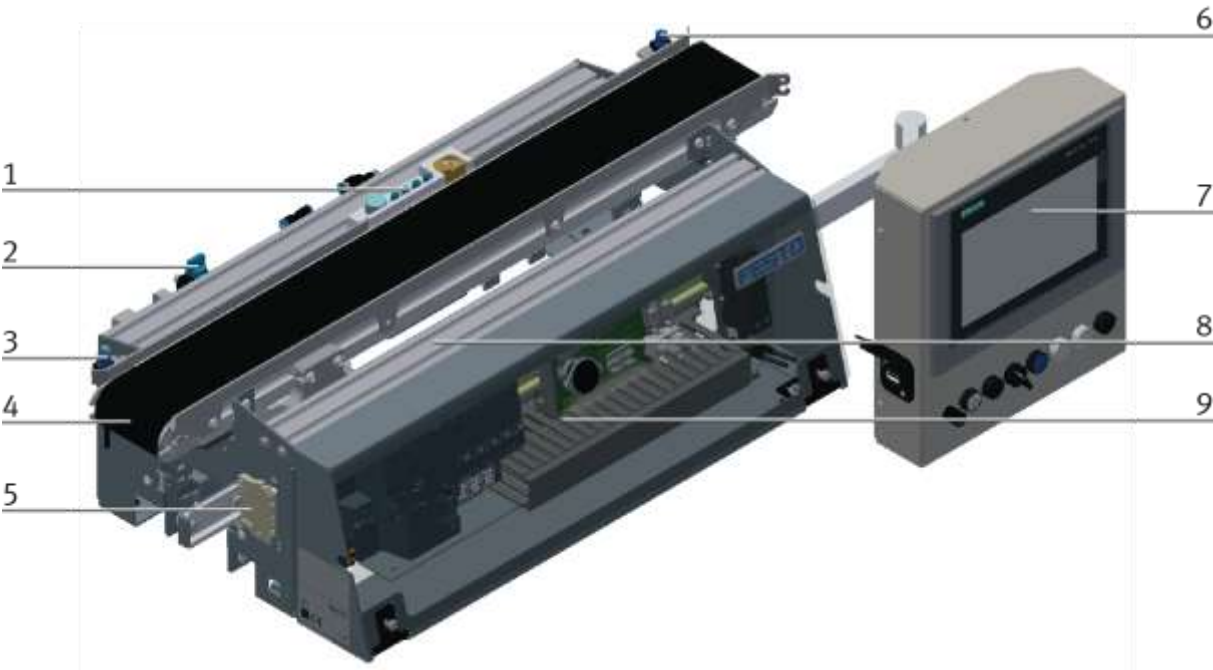


7.3 The CP Lab conveyor

The CP Lab conveyor consists of

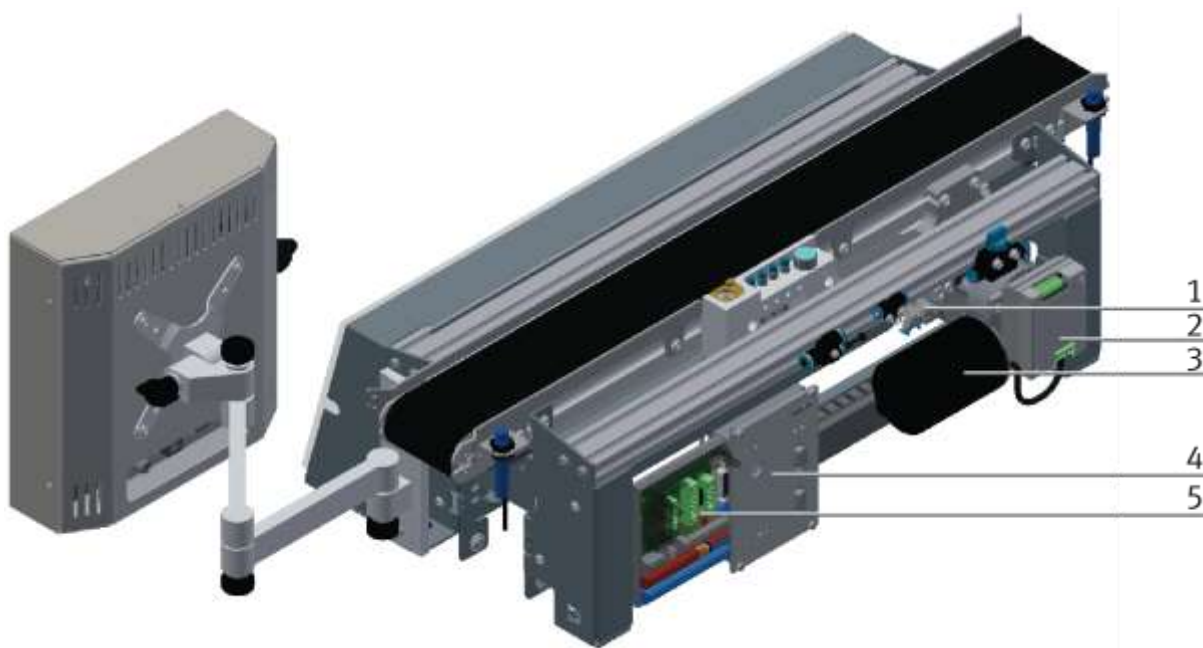
- a 80mm wide and 700mm long pallet transfer system
- a basic frame
- a control cabinet for controlling and further electrical components
- a control panel on a mike boom (option)
- On the basic frame, there are coupling sensors for an easy communication with other directly connected CP Lab conveyors.
- At the start and at the end of the CP Lab conveyor, there are capacitive sensors which recognize the pallet on the CP Lab conveyor.
- A stopper unit with different ways of identification which stops and identifies the pallet.
- A 24V geared motor which can be replaced by other motors (230 V / 400V). On the motor, there is an incremental encoder for detecting the rotational speed.

The CP Lab conveyor is designed for transporting pallets with workpieces to move back and forth or for transporting them to further CP Lab conveyors. Easy tasks can be realized here. It is also possible to extend the CP Lab conveyor with different applications. This way, the field of activity can be extended as desired.



Pallet transfer system front view / illustration similar

Position	Description	Position	Description
1	Stopping unit for carrier	6	Capacitive sensor end of conveyor
2	On-off valve	7	Control panel / Touch panel (CP-L-HMI T7 / optional) Partnumber 8091107
3	Capacitive sensor start of conveyor	8	Basic frame
4	Conveyor	9	Control cabinet for electrical components and controlling
5	Coupling sensor previous station		



CP Lab conveyor rear view / illustration similar

Position	Description	Position	Description
1	Valve stopper with manual override 574351 / VUVG-L10-M52-MT-M5-1P3	4	IO-Link DA-Interface
2	2-quadrant controller for motor	5	Circuit board backside XZ2
3	alternatively 24 V motor / 230 V Motor / 400 V Motor		

7.4 Stopper unit

The stopper unit is located in the middle of the CP Lab conveyor. The carrier runs over the extended stopper unit. The screw (pos. 1 picture below) runs into the slot of the carrier. At the end of the slot the carrier is stopped.

With the help of the sensors at the stopper unit, the carrier can be identified. There are two ways for identifying:

- Variant 1
It is identified by 4 inductive sensors; for this exercise, the carriers may be provided with grub screws at different positions.
- Variant 2
The identity is read by the RFID sensor.

It is also possible to use the first of the inductive sensors for controlling; in this case the first grub screw is read and reports the position of the workpiece at the stopper.

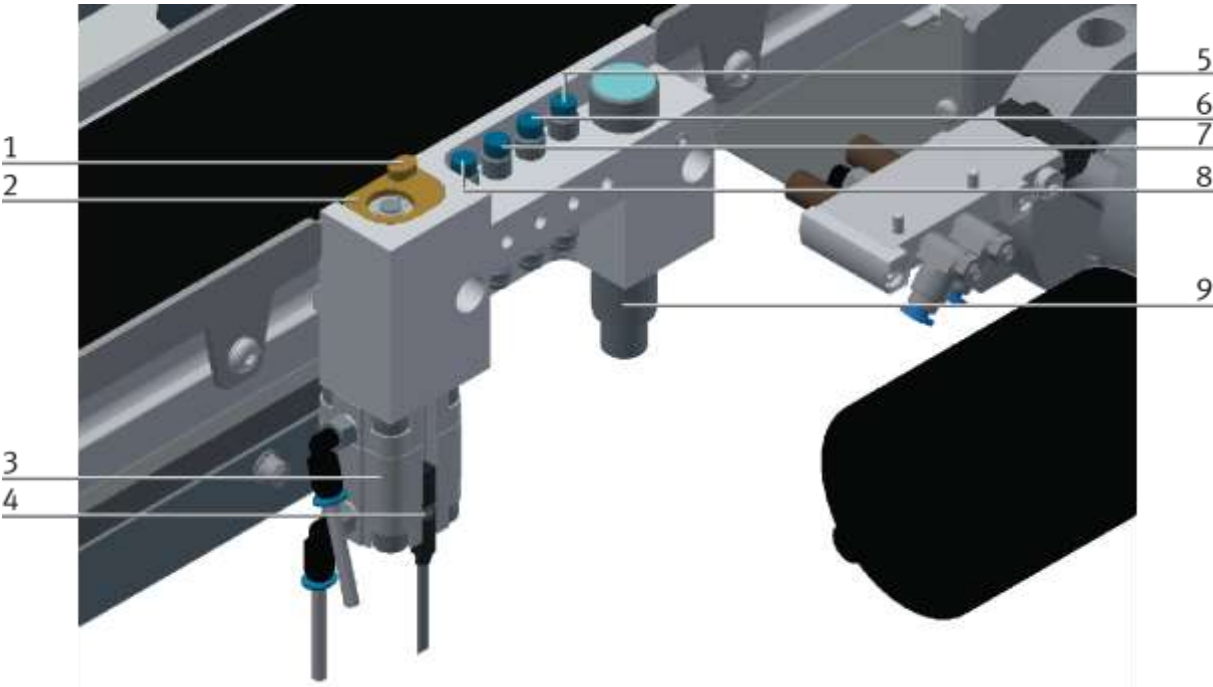
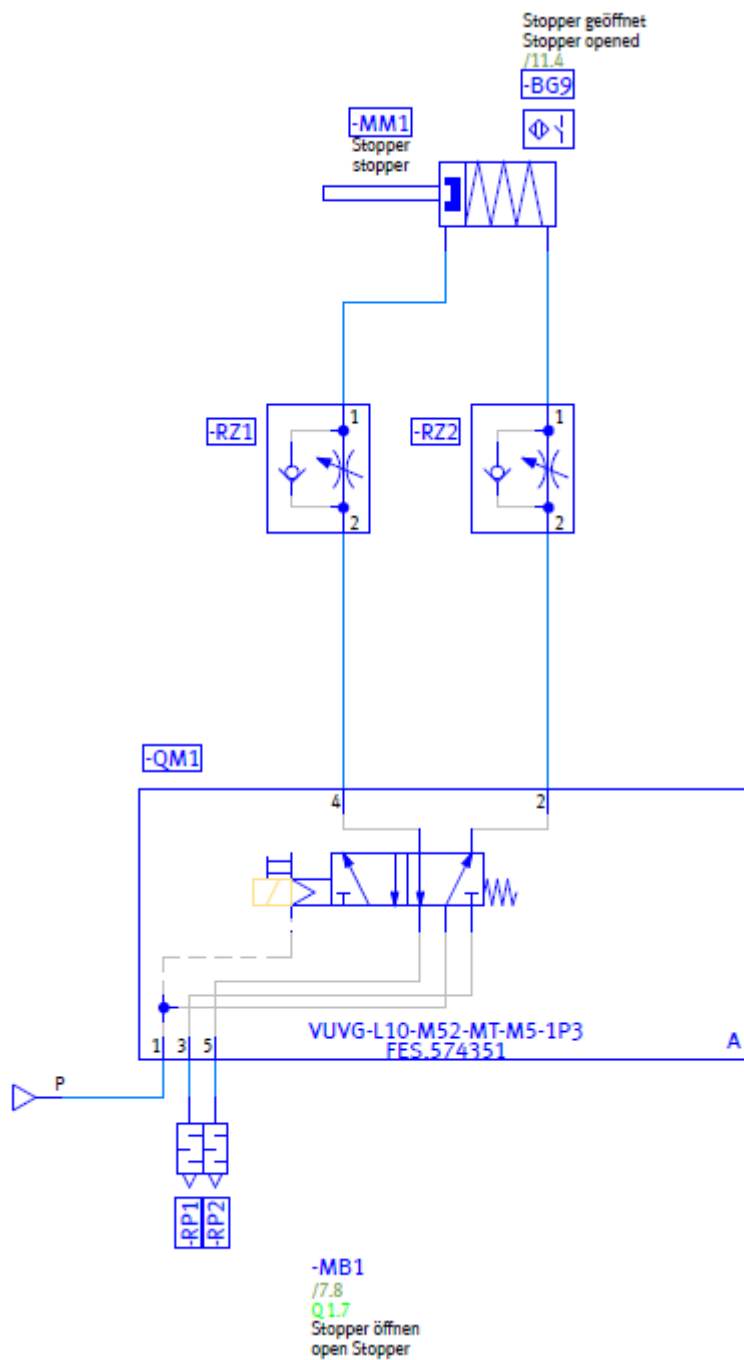


illustration similar

Position	Description	Position	Description
1	Stopper and guide for carrier	6	Inductive sensor 150395 / SIEN-M8NB-PS-S-L
2	Sprung stopper ratchet	7	Inductive sensor 150395 / SIEN-M8NB-PS-S-L
3	Stopper 157211 / AEVUZ-16-5-P-A	8	Inductive sensor 150395 / SIEN-M8NB-PS-S-L
4	Sensor for stopper retracted 574334 / SMT-8M-A-PS-24V-E-0,3-M8D	9	RFID read-write head M18 Siemens 6GT2821-1AC32
5	Inductive sensor 150395 / SIEN-M8NB-PS-S-L		

The CP Factory / Lab stop unit consists of

- 1 spring-return cylinder AEVUZ-16-5-P-A with 2 pneumatic connections
- 2 One-way flow control valves (exhaust air throttles)
- 1 monostable 5/2-way valve (VUVG-L10-M52-MT-M5-1P3)
- 1 brass element
- 1 spring



Set up:

In the internal thread of the cylinder piston rod, a hexagon socket screw with washer is introduced. The washer forms a positive fit with the brass element as long as the brass element is not pressed down by hand and the cylinder is in the home position. Between brass element and cylinder body a spring is inserted. The cylinder is connected via two connections, each with a one way flow control valve. The one way flow control valves are connected to the monostable 5/2-way valve.

The use of the spring-return cylinder as a double-acting cylinder with a monostable 5/2-way valve is due to the following requirements for the stopper:

Stopper requirements:

- In the basic position the piston rod of the cylinder should extend.
- The speed for retracting and retracting the cylinder should be adjustable separately.
- Excessive noise during the extension and retraction movement of the cylinder should be avoided.
- In the event of compressed air or voltage drop, the cylinder must assume its basic position, ie extend.
- Compressed air and / or voltage must not lead to any hazard exposure.
- The extension of the cylinder must not exert excessive impact on an overlying carrier.
- The cylinder should be dimensioned as small as possible.

Analysis of the movement profile:

Situation:

In the depressurized state, the piston rod is in the upper end position due to the spring return, as it is a compact cylinder of the AEVUZ (pulling mode) series. Also, the brass element is in the upper end position, since due to the extended cylinder piston rod, the spring between brass element and cylinder body is relaxed.

Both the brass element, as well as the piston rod can be pressed down in the pressureless state. Brass element and piston rod then return to their normal position.

Compressed air connection / resistance:

As soon as the compressed air is switched on, the piston rod can no longer be pushed down by hand. However, the brass element already, since its position in the basic position of the cylinder depends only on the state of the spring between the brass element and the cylinder body.

The behavior with compressed air connection / resistance is comparable to the upward movement:

Upward movement:

The 5/2-way valve ventilates in the basic position, the lower chamber of the cylinder. The rising pressure in the lower chamber and the spring installed in the cylinder press the piston rod out of the cylinder housing until the upper end position is reached. In this case, the one way control valve -RZ2 allows the compressed air without throttling. The compressed air from the upper chamber escapes via the one way control valve -RZ1. This is therefore an exhaust air throttling. This allows the speed of the upward movement to be adjusted.

If no carrier is located above the stopper, the brass element also returns to its basic position. The upward movement of the piston rod relaxes the spring between the brass element and the cylindrical body during the movement. This also pushes the brass element upwards.

If a carrier is located above the stopper, the measuring element is pressed against the carrier by the force of the spring between the measuring element and the cylinder body. The spring force is low enough that the carrier is not pushed upwards and is strong enough for the measuring element to return to the basic position after the carrier has left the stopper.

Downward movement:

If the valve coil or manual control of the monostable 5/3-way valve is actuated, the valve changes to the working position. The lower chamber of the cylinder is vented through the throttle of the one way flow control valve -RZ2, while -RZ1 causes the compressed air to flow unimpeded into the upper chamber of the cylinder. This is therefore also an exhaust air throttling. Thus, the speed of the downward movement can be adjusted via -RZ2.

During the downward movement, the spring of the cylinder and the spring between the measuring element and the cylinder body are additionally pretensioned.

Monostable 3/2-way valve with throttling and single-acting cylinder

This variant can not be used since

- the speeds for the extension and retraction movement can not be set independently of each other
- due to the small size of the single-acting cylinder, a precise adjustment of the supply air throttle is made more difficult => noise
- In the case of small sizes of the single-acting cylinder with exhaust air throttling, no sufficiently large compressed air cushion can be built up in the chamber so that the mechanism of the exhaust air throttling has a positive effect

7.5 Drive versions

Whether DC motor or servo motor - the conveyor belt can be combined with all motors in just a few steps. Professional couplings or toothed belt transmissions convey maximum industrial practice with optimum didactic modularity.

7.5.1 Gear motor 24 V DC

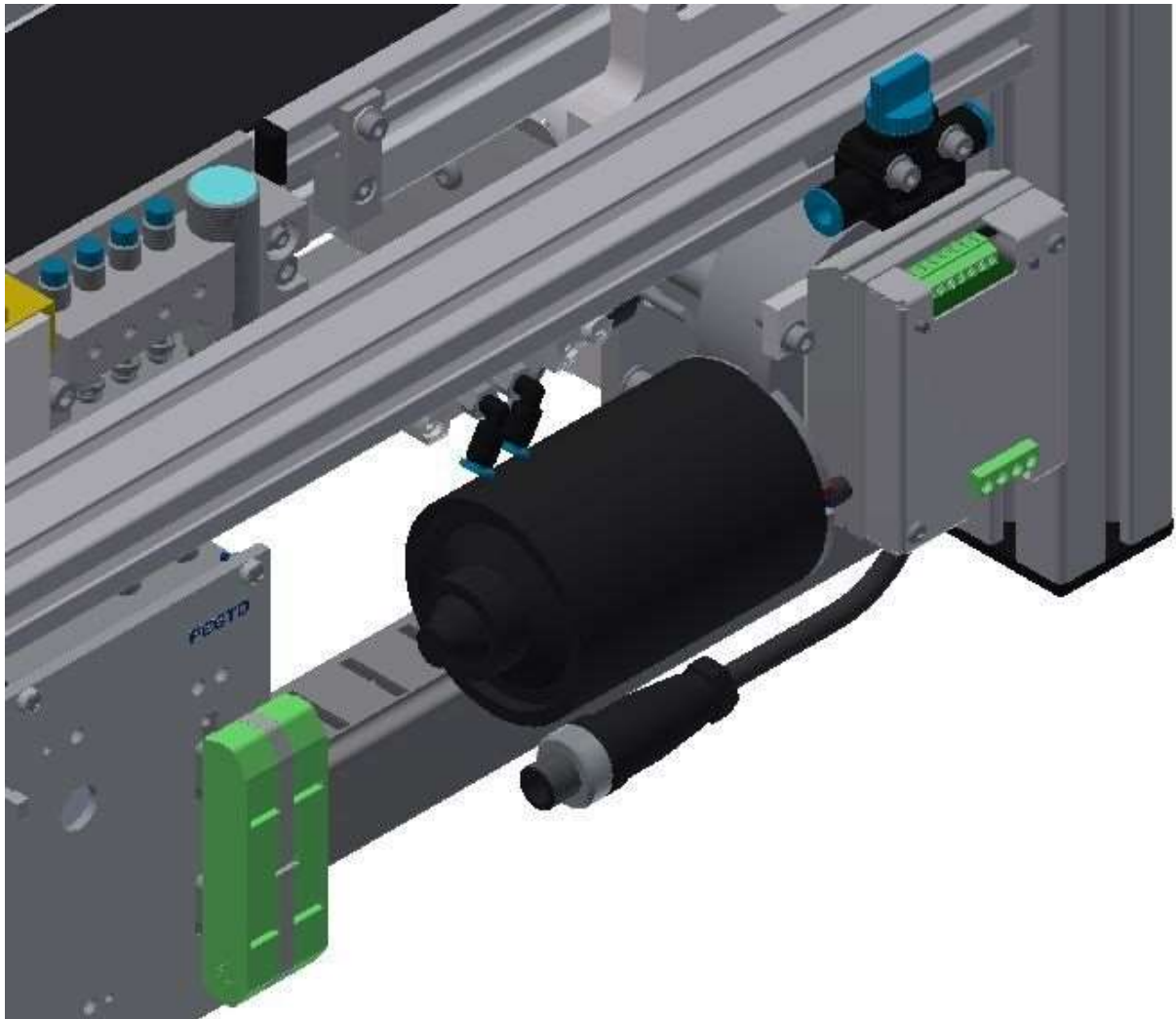


illustration similar

Valid for (see chapter type code)

CP-L-LINEAR-C11-M0-V2

CP-L-LINEAR-C13-M0-V2

7.5.2 Three-phase asynchronous motor with gearbox and self-ventilation 230 V AC

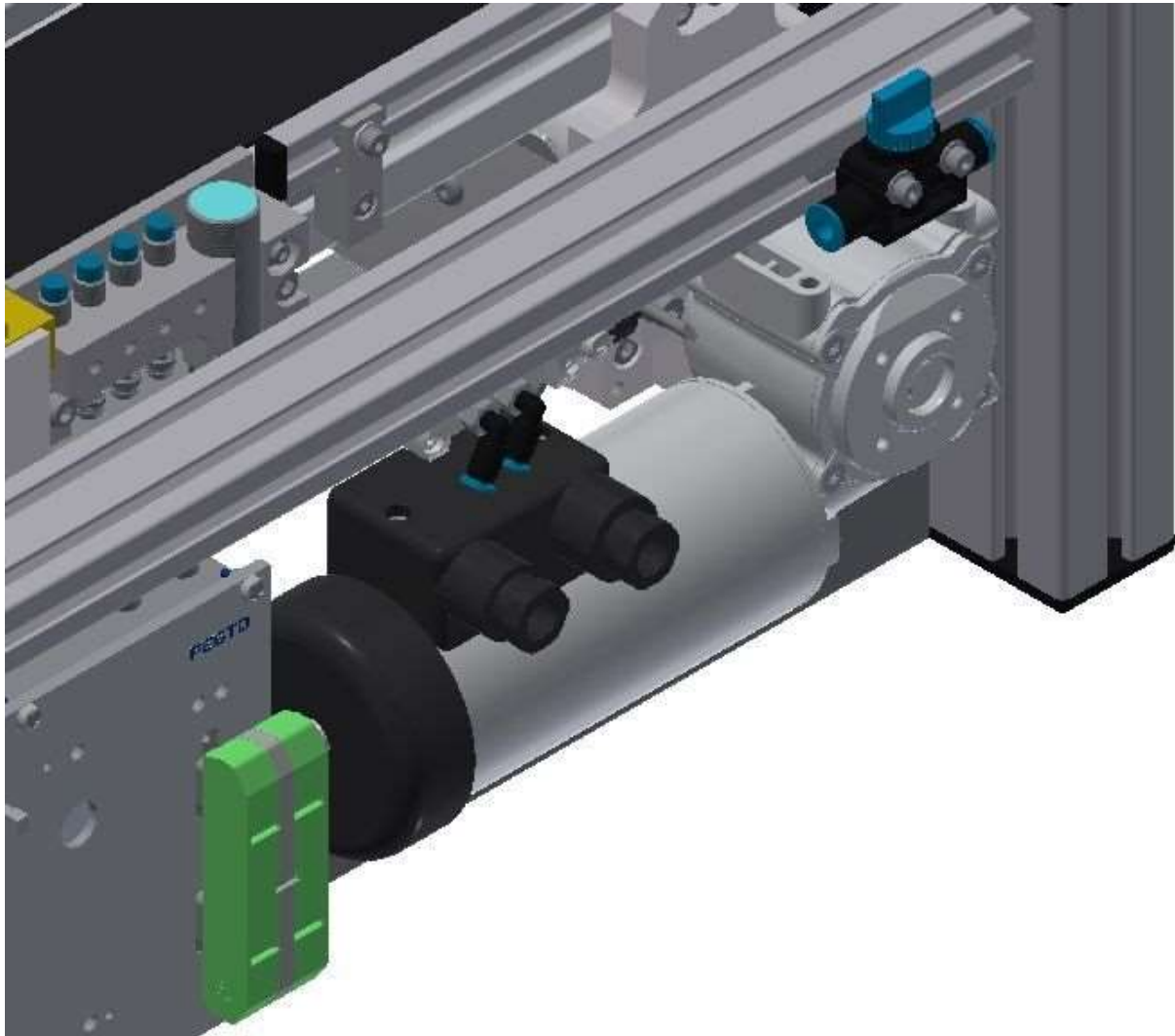


illustration similar

Valid for (see chapter type code)

CP-L-LINEAR-C11-M1-V2

CP-L-LINEAR-C13-M1-V2

7.5.3 Asynchronous motor with gearbox and self-ventilation 400 V AC

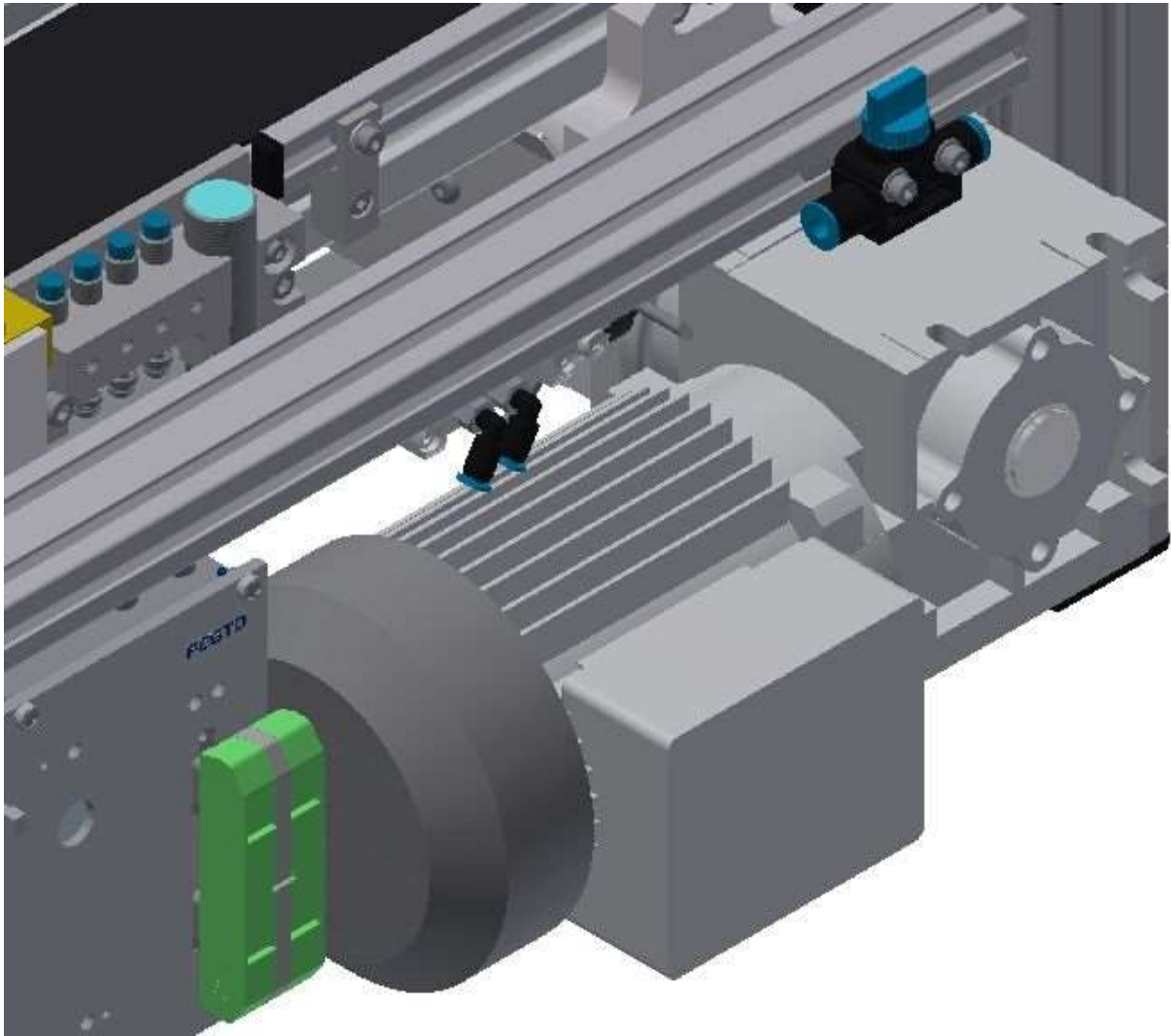


illustration similar

Valid for (see chapter type code)

CP-L-LINEAR-C11-M6-V2

CP-L-LINEAR-C13-M6-V2

7.6 Signal generator

The drive unit is provided with an encoder with 8 cut-outs. The encoder is interrogated by 2 light barriers, which makes the evaluation of the rotational speed possible.

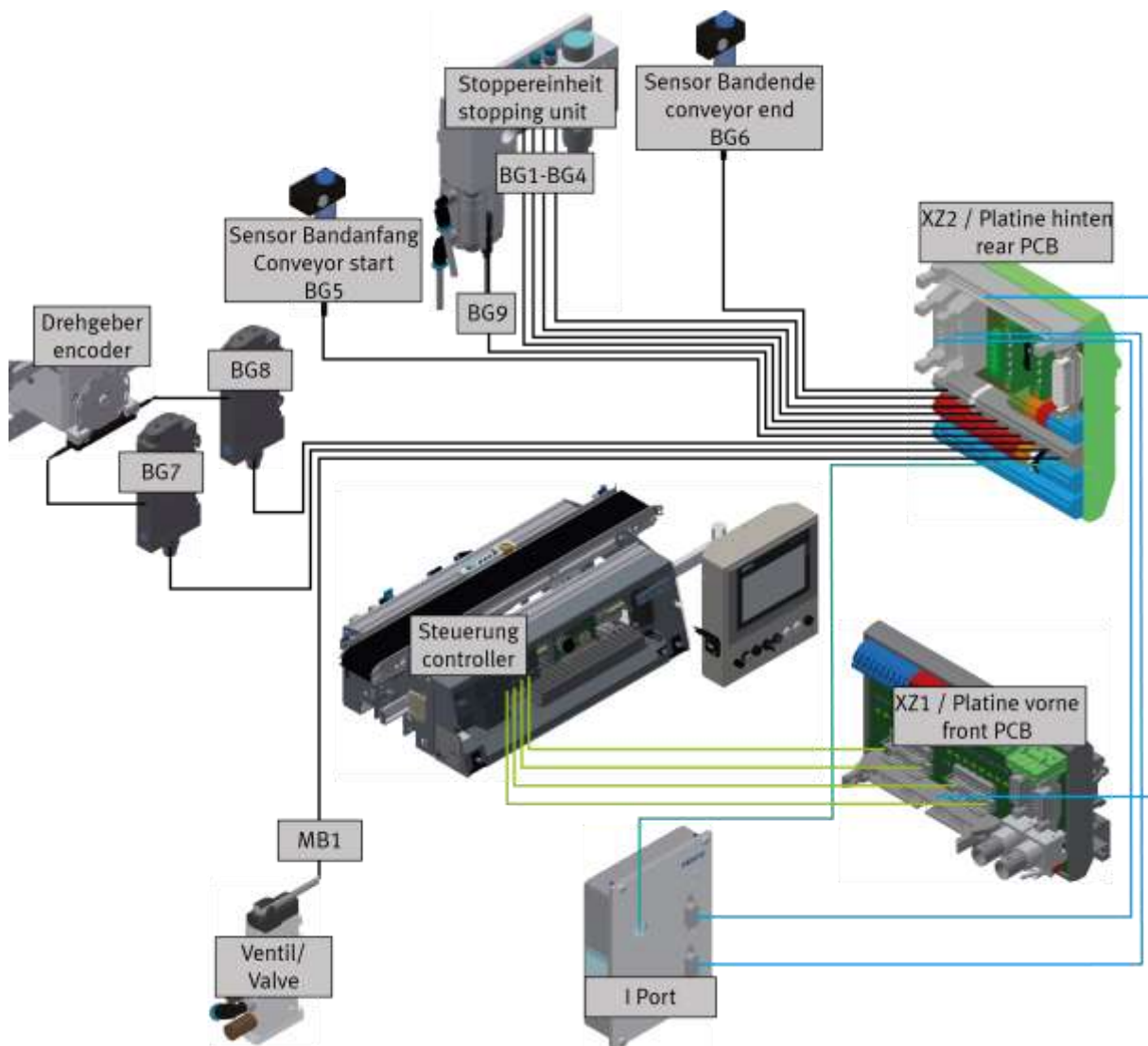
One turn is 94,2 mm



illustration similar

Position	Description
1	Light barrier channel A (BG8) / signal or coupling sensor is selectable with switch on the circuit board (left turning signal, right coupling sensor)
2	Light barrier channel B (BG7) / signal or coupling sensor is selectable with switch on the circuit board (left turning signal, right coupling sensor)

7.7 Electrical connections

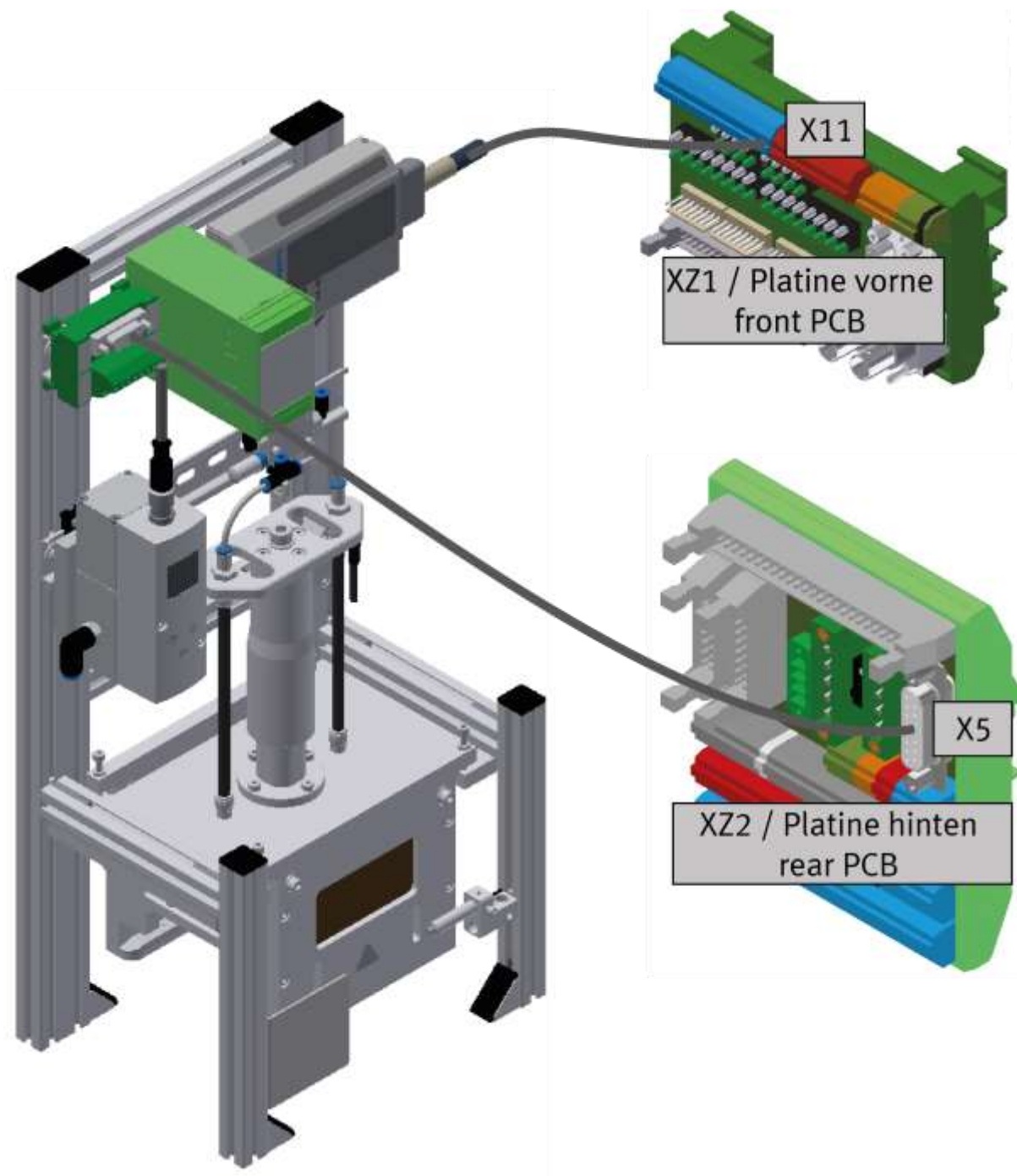


Electrical connections / illustration similar

The shaft encoder has got 2 channels, channel A is connected with the output unit BG8, channel B is connected with the output unit BG7. The output units can be connected alternatively to the coupling sensors. (left turning signal, right coupling sensor)

The iPort is connected to the I/O link master of the ET200 SP.

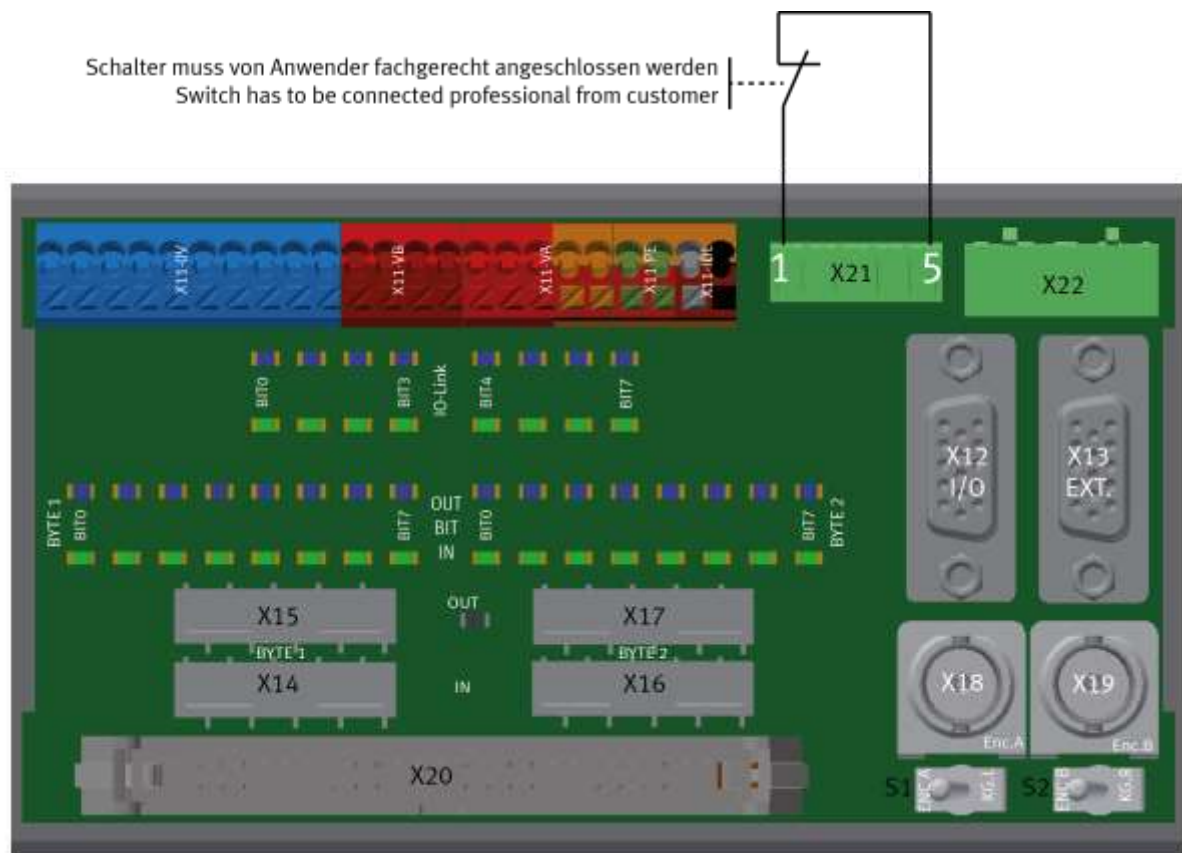
Instead of the controller, it is possible to install a I/O Terminal.



Electirc connection application module / illustration similar

If an application module is connected to the CP Lab conveyor, the cable that is hardwired to X11 is plugged into the SYS-Link connector of the I / O terminal. If the application module has an analogue interface, the analogue terminal is plugged into the rear XZ2 board at interface X5.

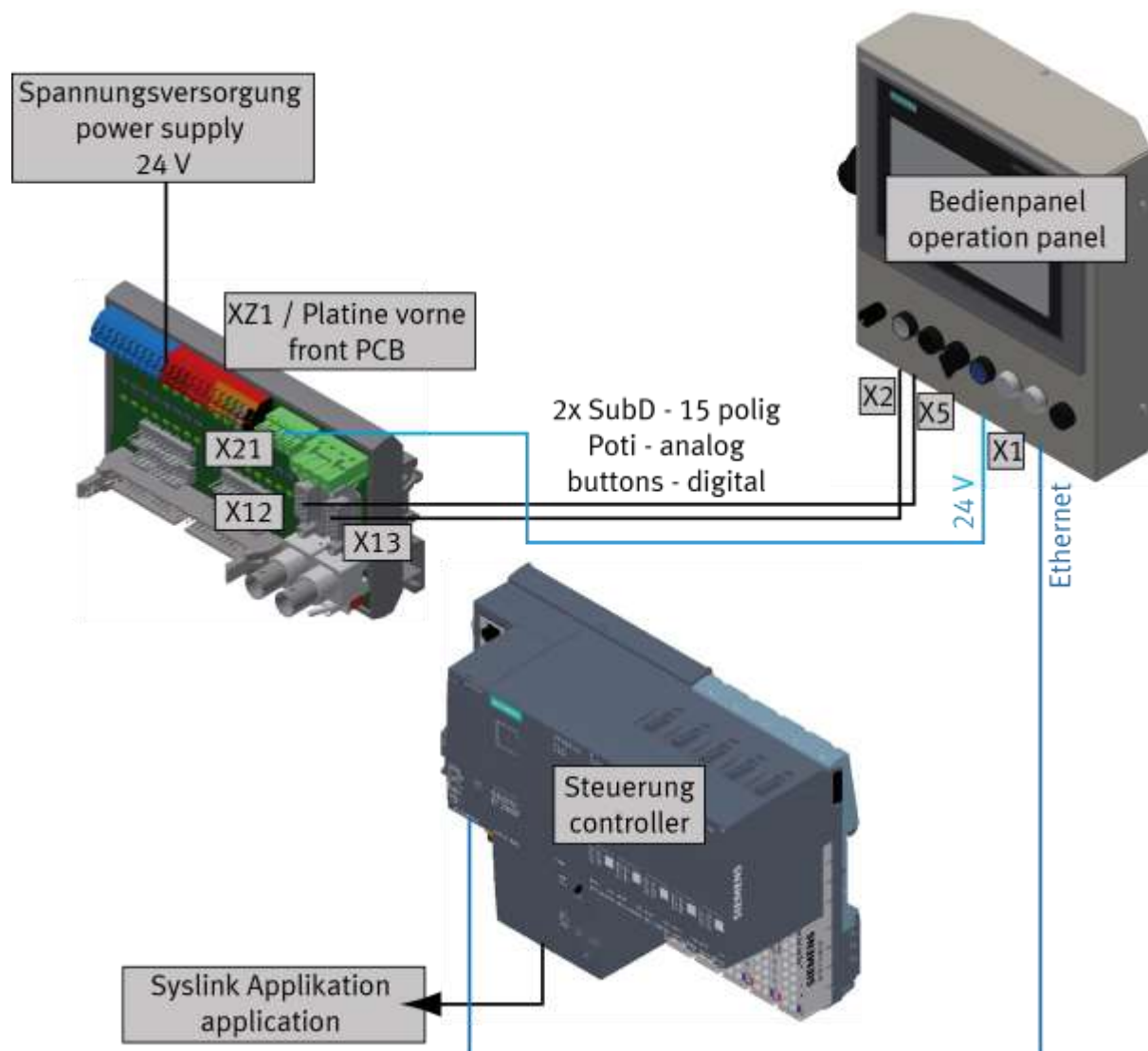
7.7.1 Connections without HMi



Further electrical connections / illustration similar

If there is no HMi Touchpanel, a switch has to be connected at the front PCB. Connect clamp 1 from X21 plug with clamp 5 from X22.

7.7.2 Connections with HMi (option)



Further electrical connections / illustration similar

The potentiometers of the control panel are connected to the 15 pole SubD plug on the control panel. There are also 4 I/O signals on this plug. The cable is connected to XZ1 /X12.
 The external power supply is connected with lab cables at the XZ1.
 With the SYSlink plug, applications are connected to the controller.

7.8 Activation motors

7.8.1 Motor version 24V

Valid for (see chapter type code)

CP-L-LINEAR-C11-M0-V2

CP-L-LINEAR-C13-M0-V2

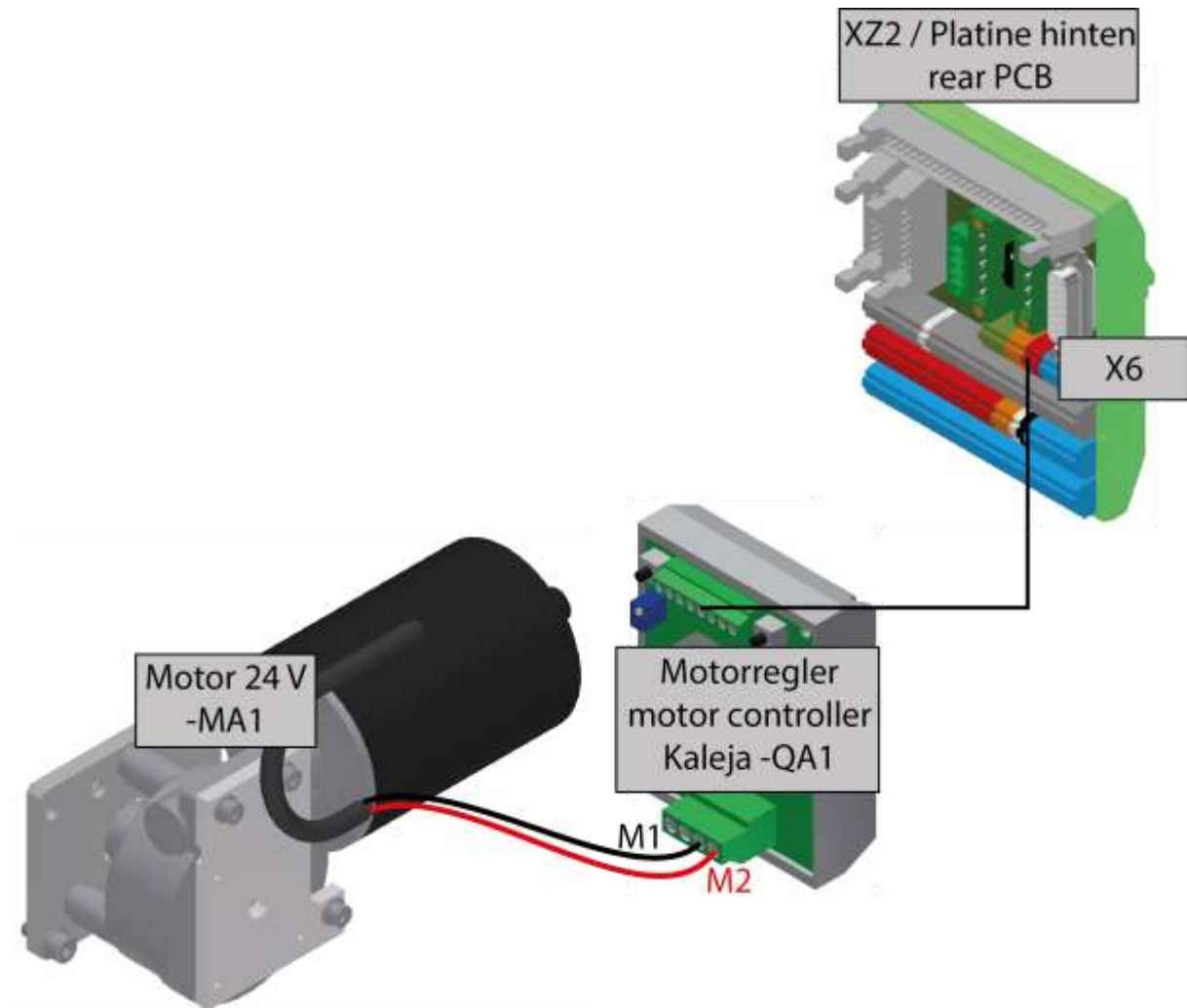


illustration similar

7.8.2 Motor version 230V

Valid for (see chapter type code)

CP-L-LINEAR-C11-M1-V2

CP-L-LINEAR-C13-M1-V2

Configured in triangle.

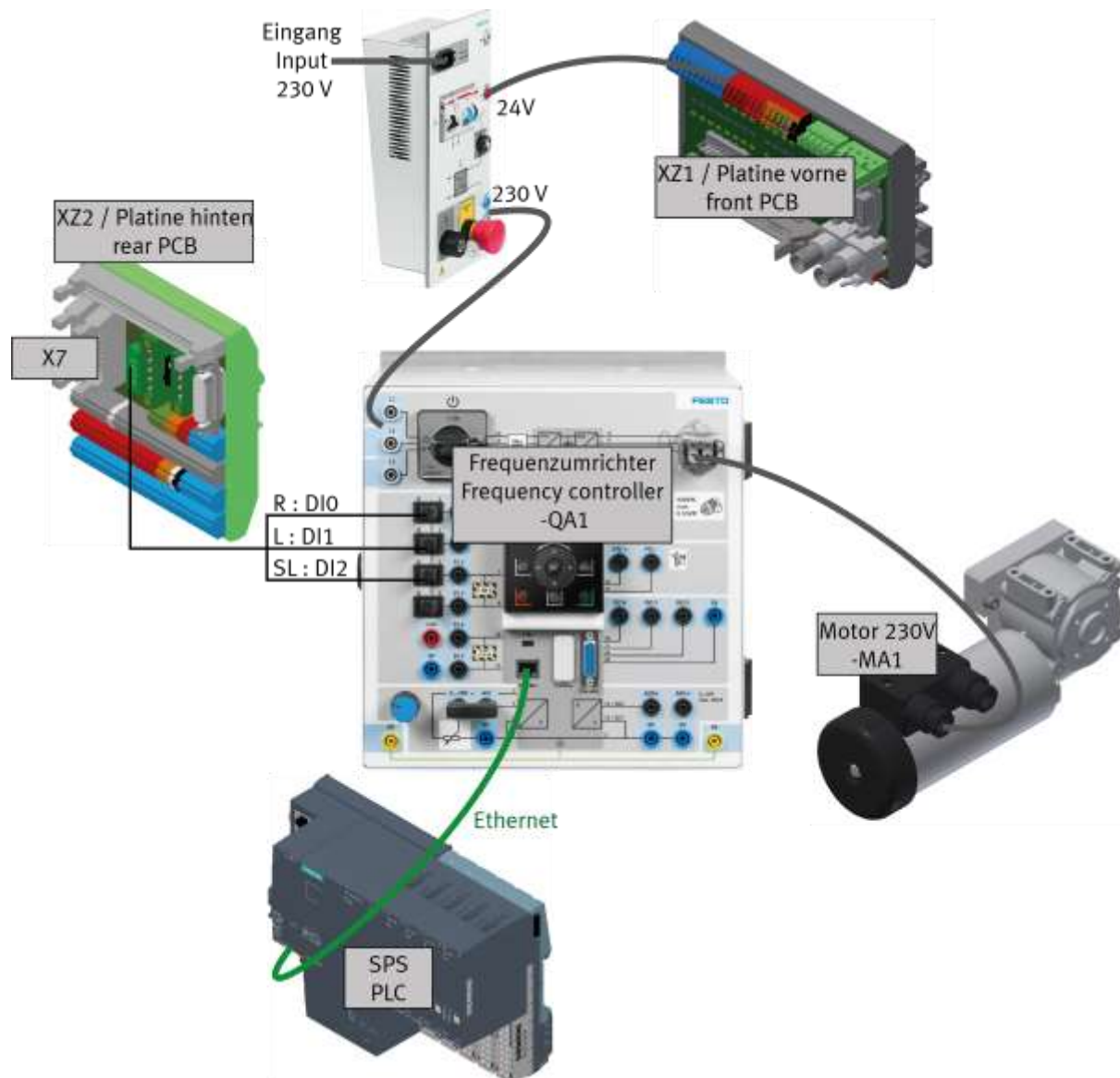


illustration similar

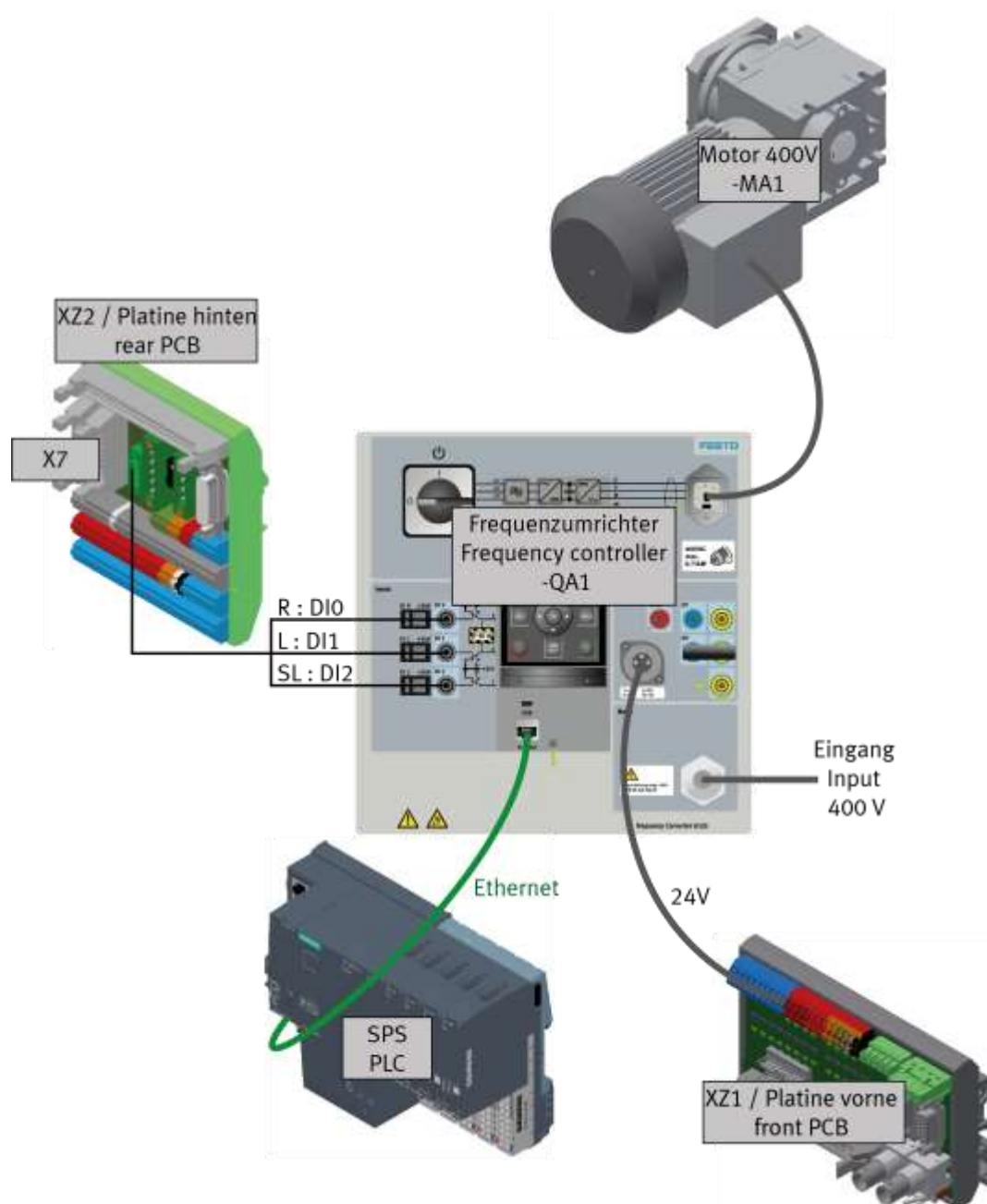
Motor MA1 – Clamps	G120 CU240-2PN / QA1- Clamps
U1	X1:1
V1	X1:2
W1	X1:3
PE	X1:PE

7.8.3 Motor version 400V

Valid for (see chapter type code)


CP-L-LINEAR-C11-M6-V2

CP-L-LINEAR-C13-M6-V2



Motor MA1 – Clamps	G120 CU240-2PN / QA1- Clamps
U1 / W2	X1:1
V1 / U2	X1:2
W1 / V2	X1:3
PE / PE	X1:PE

8 Commissioning

	<div style="background-color: #005596; color: white; text-align: center; padding: 5px;">NOTE</div> <ul style="list-style-type: none"> – The following applies to the start-up as well as to the restart.
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- The CP Lab conveyor is delivered pre-assembled.
- All attachment parts are individually packaged.
- All components, tubings and cablings have been clearly marked in order to guarantee a problem-free retrieving of all connections.

8.1 Visual Inspection

	<div style="background-color: #e67e22; color: white; text-align: center; padding: 5px;">  WARNING </div> <ul style="list-style-type: none"> • Any damages must always be repaired instantly.
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Visual inspection has to be carried out prior to every commissioning!

Before you start the CP Lab conveyor, you must always inspect the following parts regarding visual damages and function:

- Electrical connections
- Mechanical components and connections
- Emergency Stop devices

8.2 Safety Regulations

	<div style="background-color: #e67e22; color: white; text-align: center; padding: 5px;">  WARNING </div> <ul style="list-style-type: none"> • Any damages must always be repaired instantly.
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The CP Lab conveyor may only be operated on the following conditions:

- The technical condition – mechanically and electrically – of the CP Lab conveyor is perfect.
- The CP Lab conveyor is used in accordance with the regulations.
- The operating instructions have been read and understood.
- All safety devices are available and active.

8.3 Workplace

The commissioning of the CP Lab conveyor requires:

- a CP Lab conveyor
- a carrier with a pallet and a workpiece
- an on-site electrical connection in the room
- an on-site pneumatically connection in the room

8.4 Function extension by application modules

8.4.1 Assembly of an CP application module



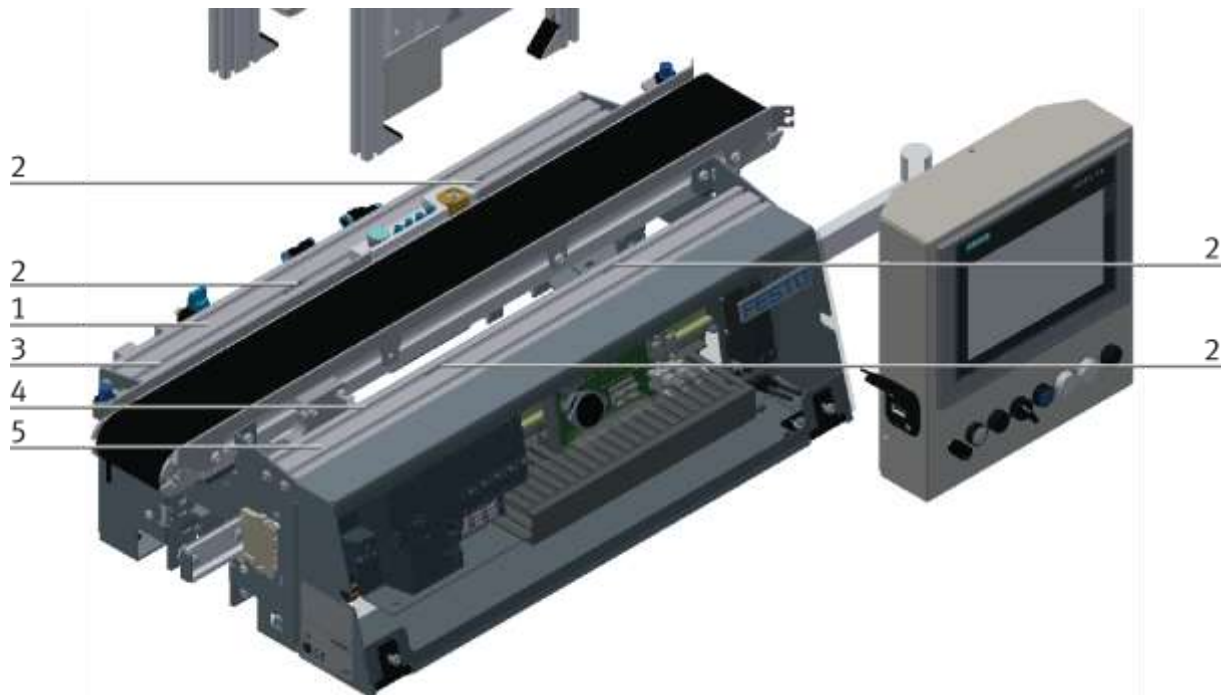
NOTE

The procedure of attaching the CP application module to a basic module is the same as with all basic modules. The following description for the attachment to a basic module. CP Lab Conveyor is an example for all basic modules and all application modules.

Positioning slot nuts in the cross profiles of the basic module CP Lab Conveyor

Mounting the CP application module is very easy:

- Two M5-slot nuts (2) have to be put into the inner front slot of the cross profile (4) of the basic module CP Lab Conveyor.
- Then put two additional M5-slot nuts (2) into the inner back slot of the cross profile (3) of the basic module CP Lab conveyor.
- Then you have to position the slot nuts (2) approximately to the distance of the vertical cross profiles of the CP application module.




Positioning slot nuts / illustration similar

Position	Description
1	back cross profile
2	slot nut
3	Inner slot (back cross profile)
4	Inner slot (front cross profile)
5	front cross profile

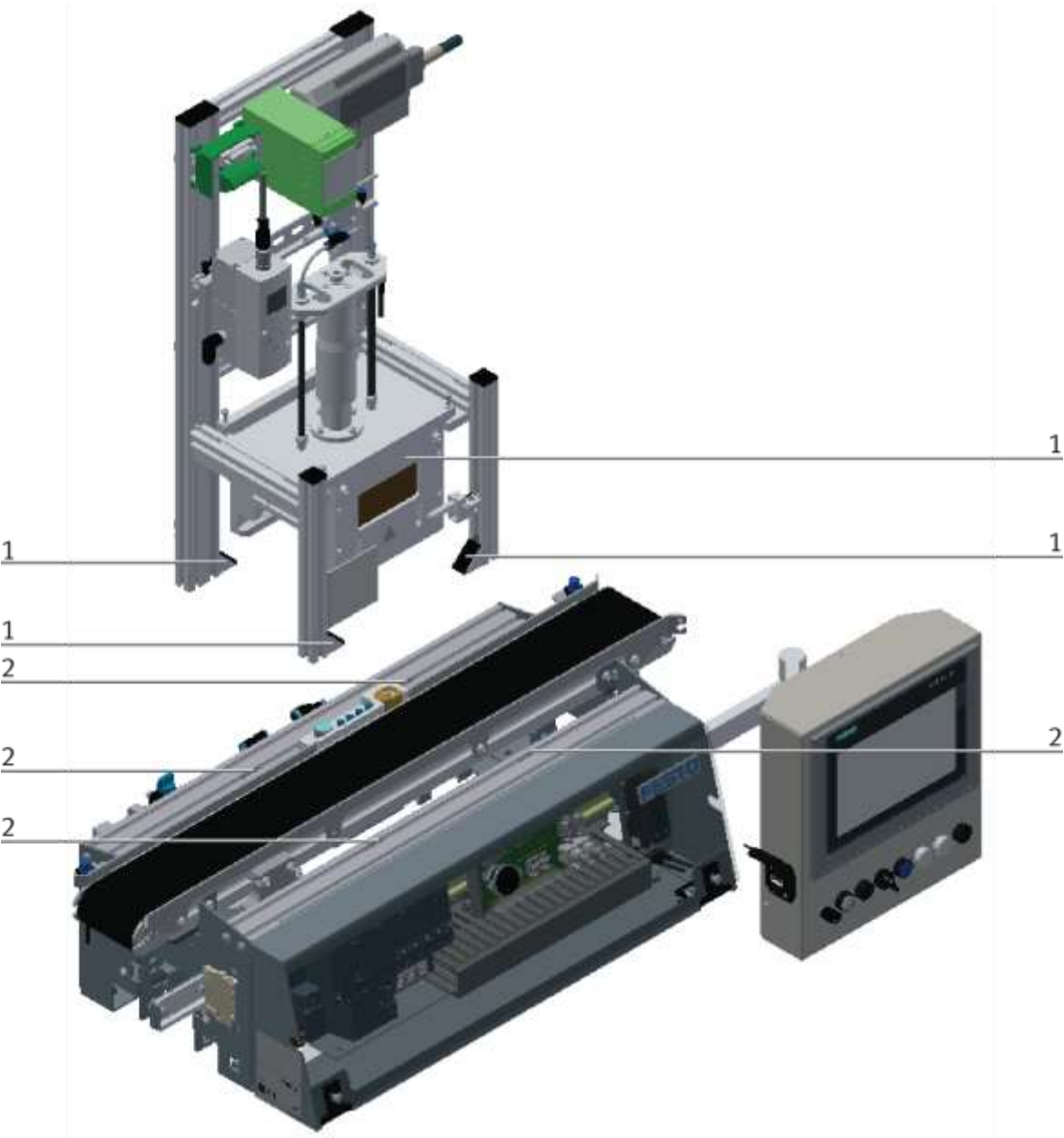
Attaching the application module to the basic module CP Lab Conveyor

- Put the CP application module on the basic module CP Lab Conveyor.
- Position the slot nuts (2) underneath the mounting brackets (1) of the CP application module so that the internal threads of the slot nuts are visible underneath the elongated holes of the mounting brackets.



NOTE

Use Allen keys for lateral adjustment of the slot nuts.

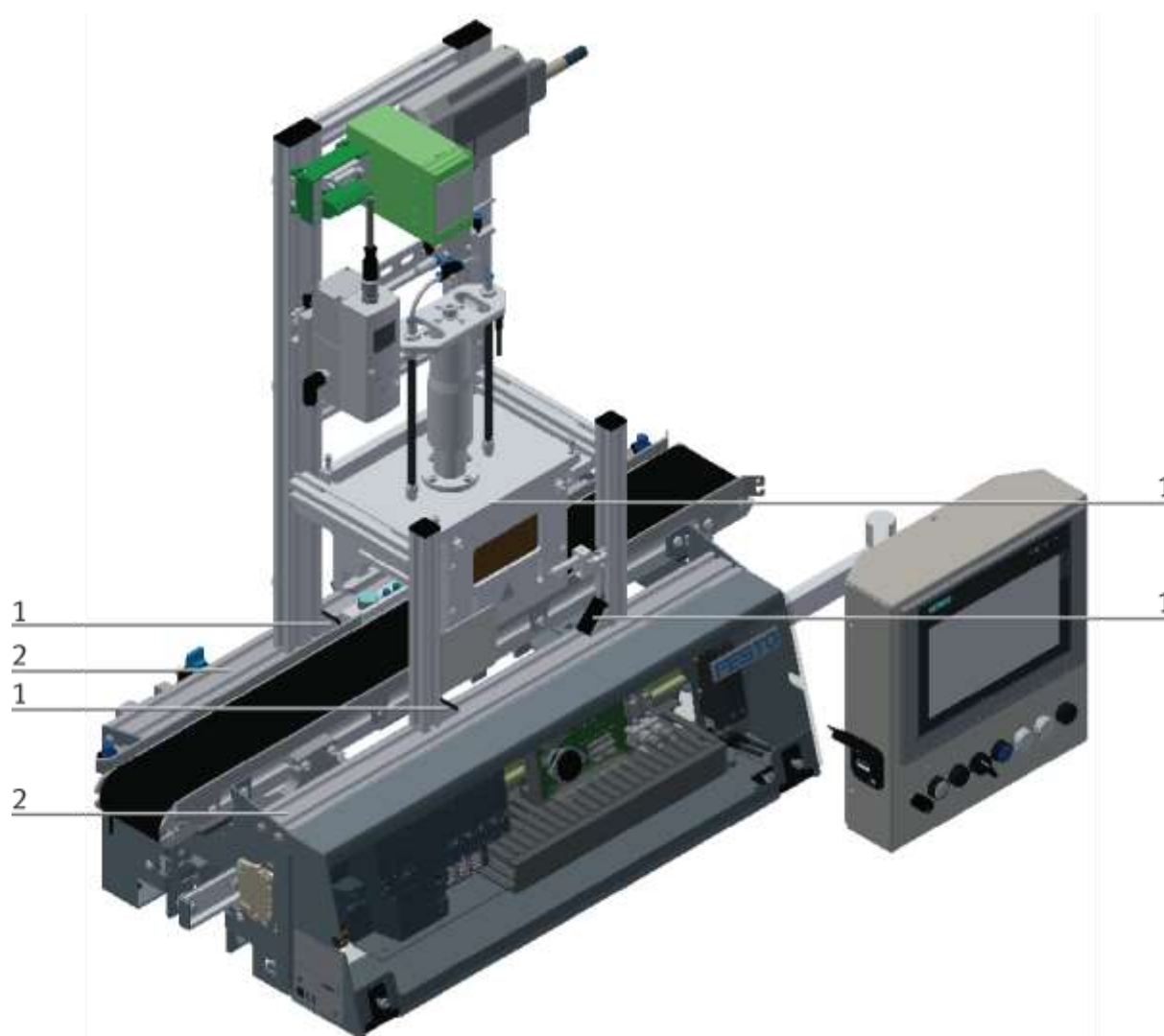


How to put on the CP application module / illustration similar

Position	Description
1	CP application module: mounting bracket
2	slot nut

Adjusting the CP application module and fixing it on the basic module CP Lab Conveyor


- Use raised head screws M5x8, in order to connect the mounting brackets (1) of the CP application module Measuring, at first loosely, with the cross profiles (2) of the basic module CP Lab Conveyor.
- After setting all raised head screws, you can still move the CP application module to the position required.
- Push a carrier with pallet and front cover to the stopper position. The front cover points with its inside upwards. The drilled hole of the front cover is on the left side.
- Have a visual inspection to make sure that the two distance sensors are capable of registering the front cover more or less in medium range.
- Now tighten the raised head screws.
- Then put the black covers onto the mounting brackets.



Tightening the CP application module / illustration similar

Position	Description
1	CP application module: mounting bracket with cover
2	basic module CP Lab Conveyor: cross profile

8.4.2 Connecting the CP application module electrically to basic module CP Lab Conveyor
SysLink-interface for digital signals

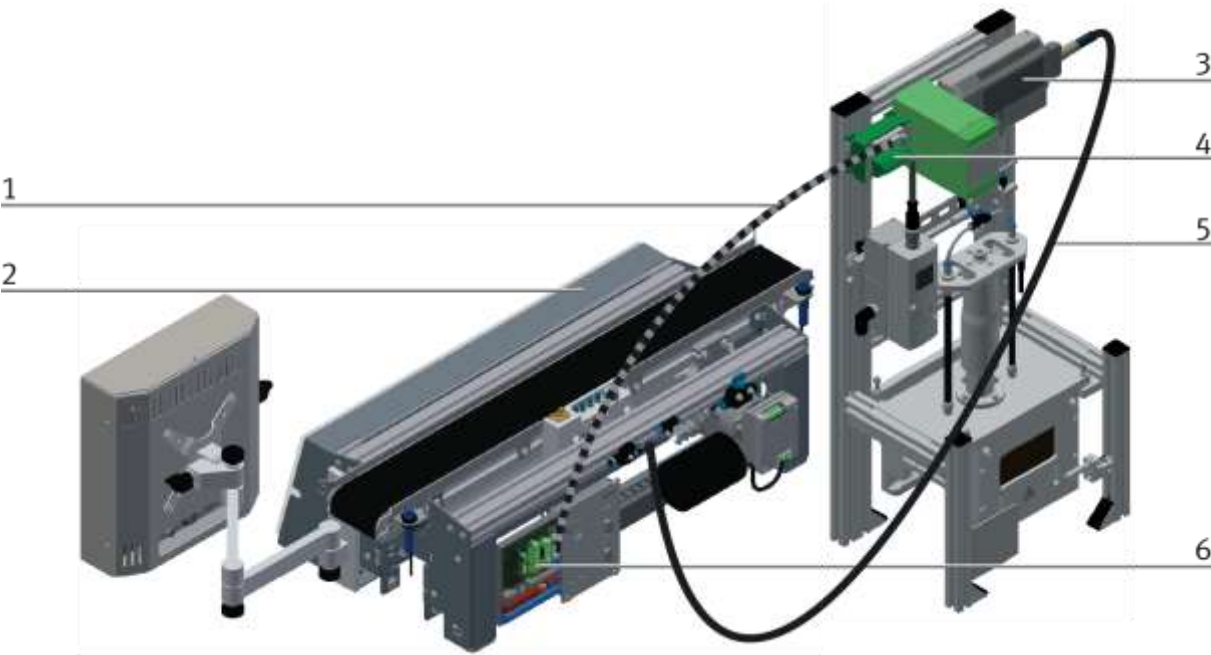


NOTE

With special variants of the basic module CP Lab Conveyor, you absolutely have to observe the corresponding operation instructions of the basic module CP Lab Conveyor!

The CP application module exchanges digital input and output signals with the basic module via the SysLink interface:

- Connect the I/O terminal (3) of the CP application module with the control (1) of the basic module CP Lab Conveyor. Therefore use the connecting cable with SysLink plugs (5) which has already been attached to the control and is led out on the back side of the basic module CP Lab Conveyor.



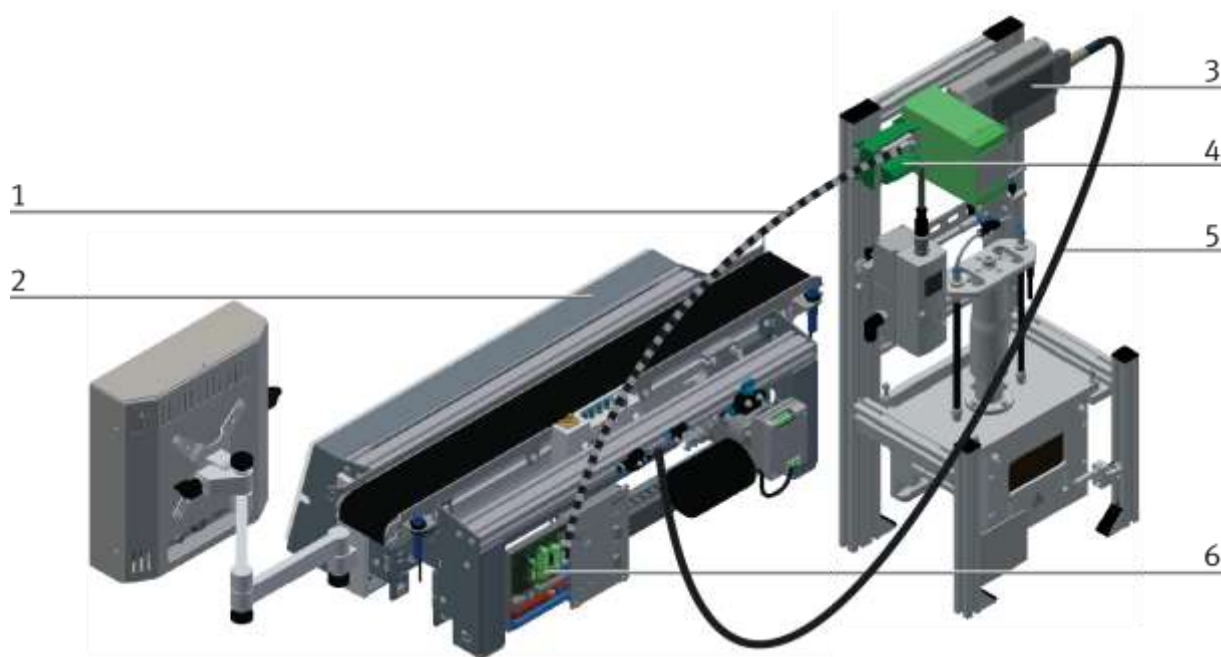
Electrical connections / illustration similar

Position	Description
1	connecting cable with15-pin standard D-Sub-plugs
2	basic module CP Lab Conveyor: control or decentralized periphery
3	CP application module: I/O terminal (+BG-XD1)
4	CP application module: analogue terminal (+BG-XD2A)
5	connecting cable with a SysLink-plug (SysLink-cable)
6	basic module CP Lab Conveyor: board at the back (+G1-XZ2)

D-Sub-interface for analogue signals (option – not available at all application modules)

The CP application module produces a analogue output signal. These is put on the analogue terminal (4) and must be connected with the analogue inputs of the basic module:

- Connect the analogue terminal (4) of the CP application module with the D-Sub-interface for analogue signals (6) on the rear board of the basic module CP Lab Conveyor. Therefore use the provided connecting cable (1) with standard D-Sub plugs: 15-pin, two-rowed.

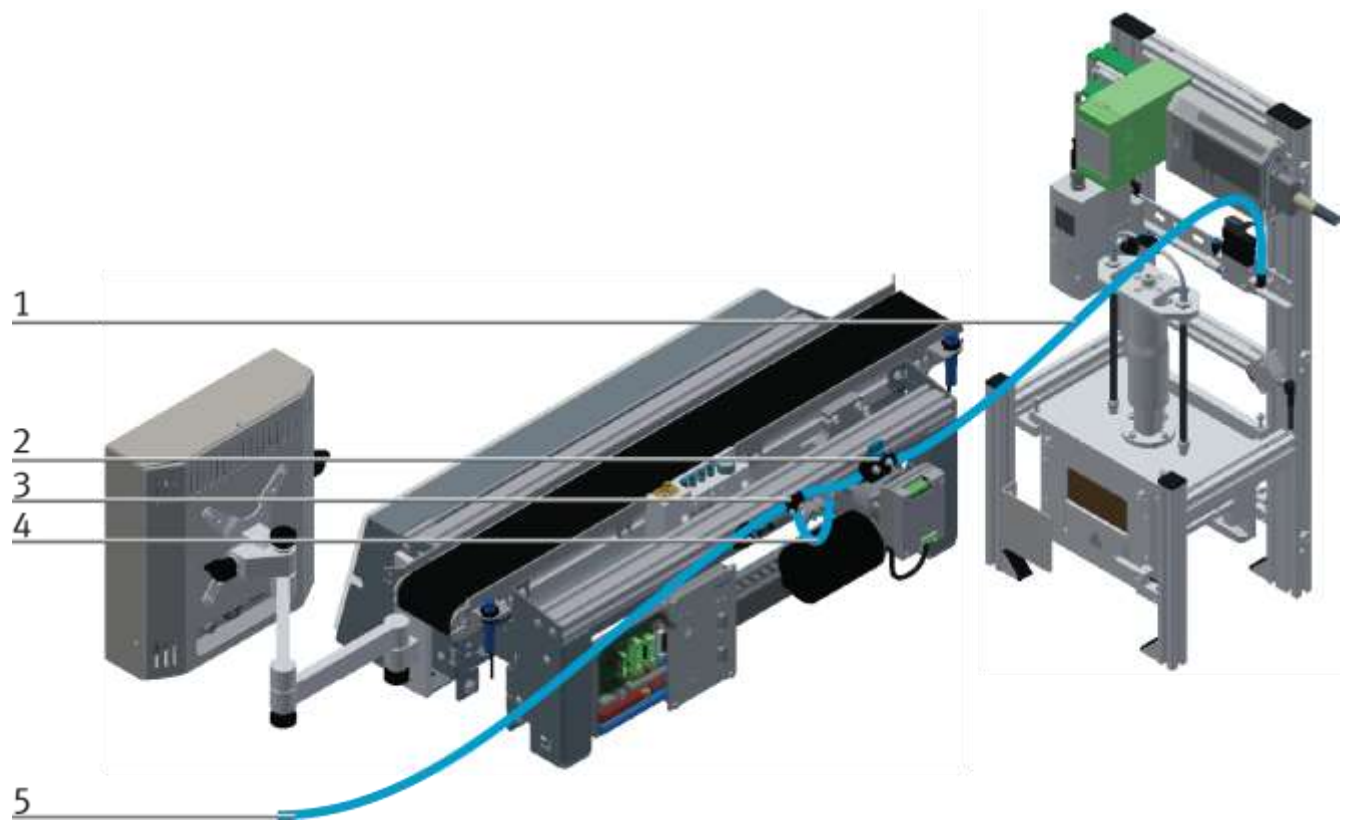


Electrical connections / illustration similar

Position	Description
1	connecting cable with 15-pin standard D-Sub-plugs
2	basic module CP Lab Conveyor: control or decentralized periphery
3	CP application module: I/O terminal (+BG-XD1)
4	CP application module: analogue terminal (+BG-XD2A)
5	connecting cable with a SysLink-plug (SysLink-cable)
6	basic module CP Lab Conveyor: board at the back (+G1-XZ2)

8.4.3 Pneumatic connection from application modules (option – not available at all application modules)

The pneumatic connection is based on the principle of the following sketch. The application module is connected from the valve terminal to the shut-off valve (2) on the conveyor belt. The hose (1) (nominal width 4) is simply inserted into the QS connector. The supply line (5) is plugged into the T-plug (3). The CP Lab Band is also supplied with a T-connector (4).



Pneumatically connect application module / illustration similar

8.5 Electrical Commissioning

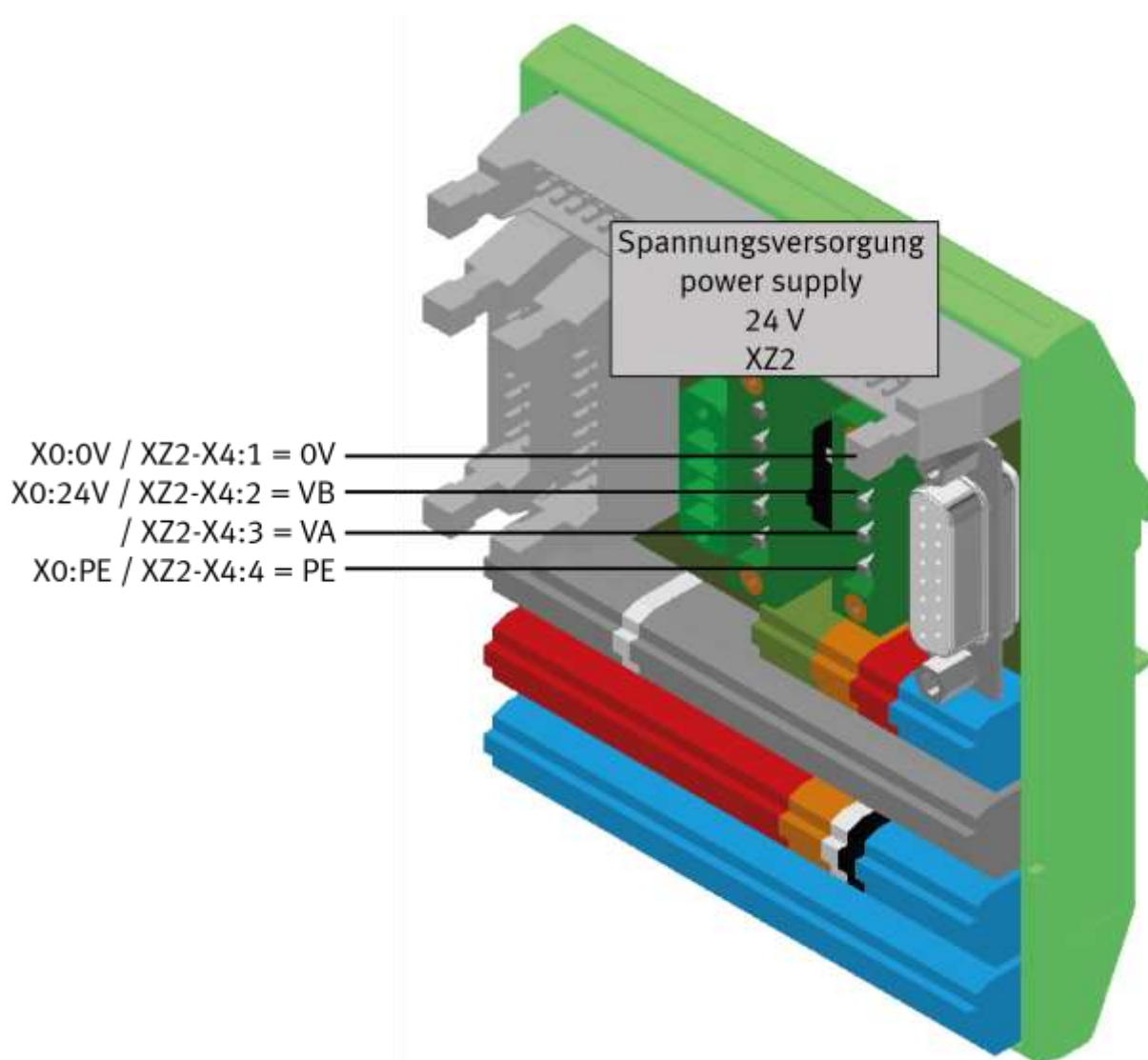
Now the CP Lab conveyor has to be supplied with electric power (24V). The external power supply has to be connected as follows:

0V to XZ2 clamp 1

24V to XZ2 clamp 2

PE to XZ2 clamp 4

The appliances are connected to the other corresponding clamps.



Wiring the CP Lab conveyor / illustration similar

8.5.1 Modus switch

Independent if the Festo Didactic IO-Link-DA-Interface is used as IO-Link-Device or an field bus node, the wiring of the I-Port-interface has to be changed. This is done by the circuit board:

Switch position:

Lower position 1=CTEU: A field bus node can be set on the Festo Didactic IO-Link-DA-Interface.

Upper position 2= IO-Link: The Festo Didactic IO-Link-DA-Interface is used as an IO-Link-device.

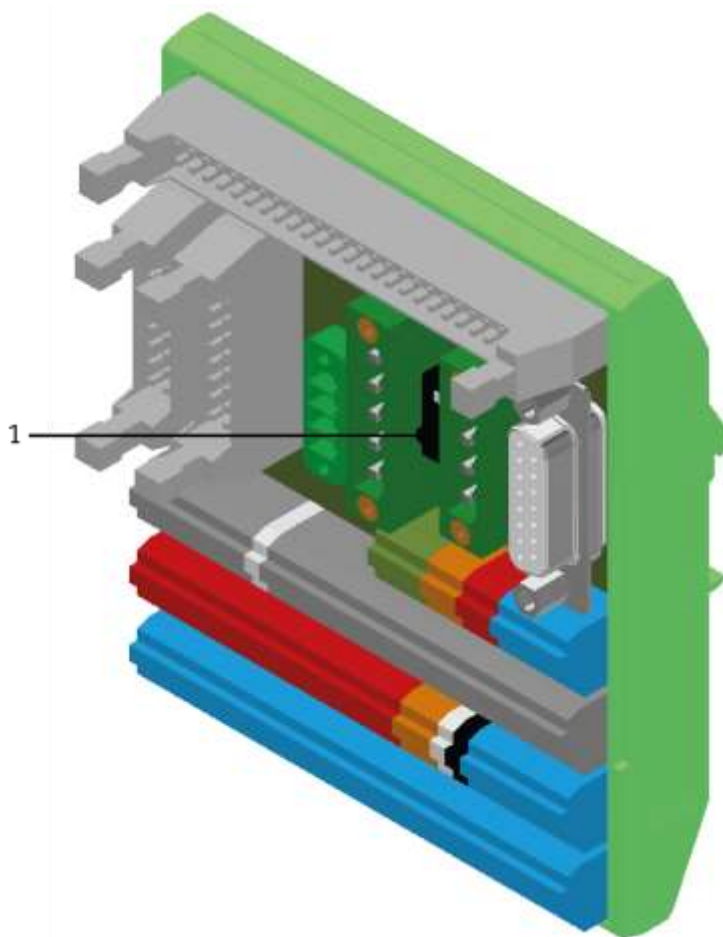


illustration similar

8.5.2 Off Button system

The touch panel (option) is provided with an OFF button actuator. With a 5 pole cable, the OFF button is connected to the power supply XZ1.

The voltage (24VDC) is supplied to the system with the clamp XZ1 from an external power supply unit. As a permanent positive (24VB), this voltage is then lead into the touch panel with the M12 cable. In the touch panel, the contact of the OFF button connects the switched positive (24VNA) with 24VB. That means, if you press the OFF button, the 24VNA will be separated from 24VB as well as all other objects at clamp XZ1 supplied by 24VNA.

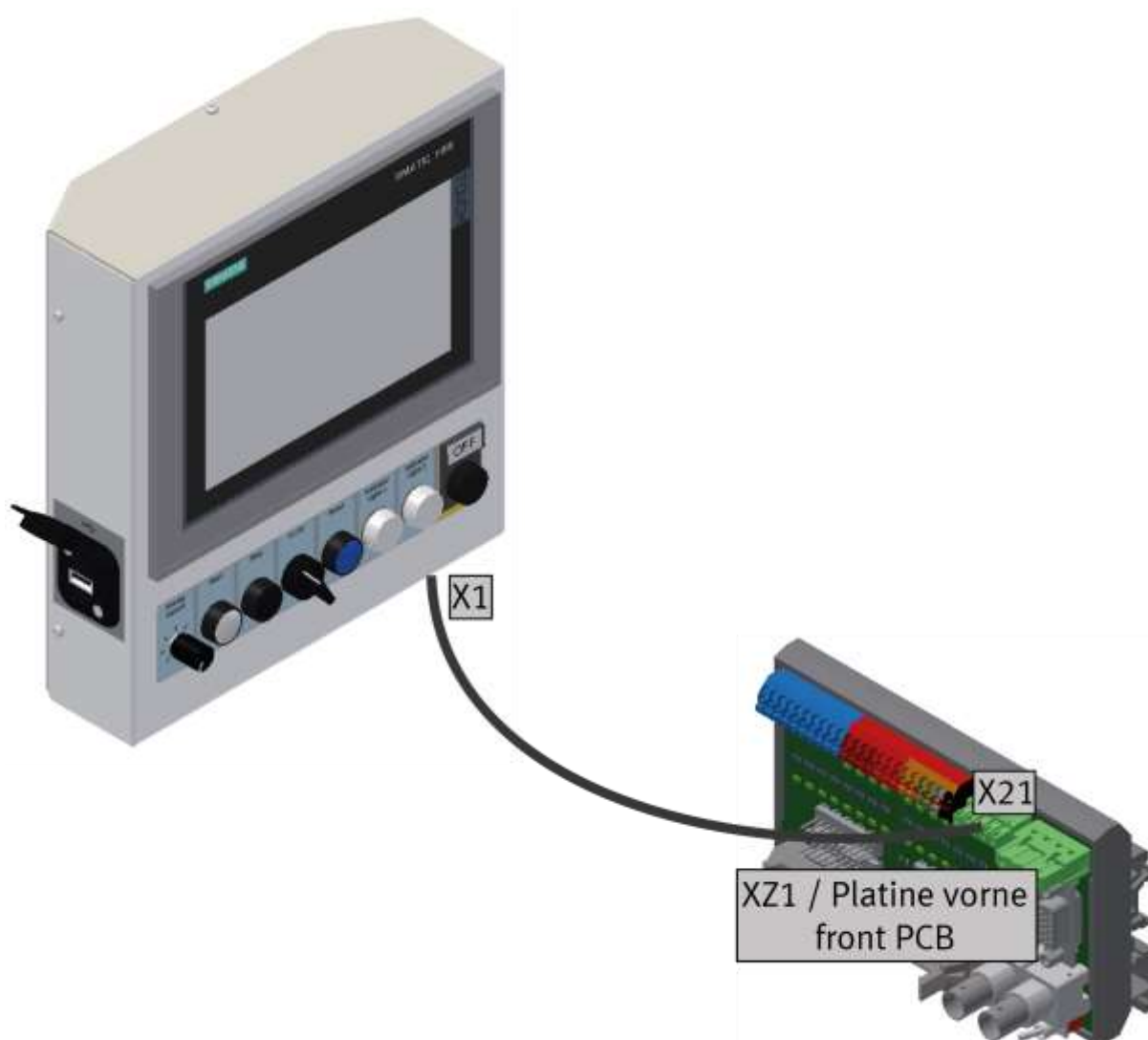


illustration similar

8.5.3 IN/Outputs

Description Interface Inputs

Name	Clamp at ET200 SP	SysLink cable	SysLink plug
Application IN0	KF2 / clamp: 1 (I0)	WG21 / GYPk	XG2: 1
Application IN1	KF2 / clamp: 2 (I1)	WG21 / RDBU	XG2: 2
Application IN2	KF2 / clamp: 3 (I2)	WG21 / WHGN	XG2: 3
Application IN3	KF2 / clamp: 4 (I3)	WG21 / BNGN	XG2: 4
Application IN4	KF2 / clamp: 5 (I4)	WG21 / WHYE	XG2: 5
Application IN5	KF2 / clamp: 6 (I5)	WG21 / YEBN	XG2: 6
Application IN6	KF2 / clamp: 7 (I6)	WG21 / WHGY	XG2: 7
Application IN7	KF2 / clamp: 8 (I7)	WG21 / GYBN	XG2: 8

Description Interface Outputs

Name	Clamp at ET200 SP	SysLink cable	SysLink plug
Application OUT0	KF4 / clamp: 1 (O0)	WG21 / WH	XG4: 1
Application OUT1	KF4 / clamp: 2 (O1)	WG21 / BN	XG4: 2
Application OUT2	KF4 / clamp: 3 (O2)	WG21 / GN	XG4: 3
Application OUT3	KF4 / clamp: 4 (O3)	WG21 / YE	XG4: 4
Application OUT4	KF4 / clamp: 5 (O4)	WG21 / GY	XG4: 5
Application OUT5	KF4 / clamp: 6 (O5)	WG21 / PK	XG4: 6
Application OUT6	KF4 / clamp: 7 (O6)	WG21 / BU	XG4: 7
Application OUT7	KF4 / clamp: 8 (O7)	WG21 / RD	XG4: 8

Description Interface Voltage



Name	SysLink cable	SysLink plug
24VB	WG21 / WHPK	XZ1/X11: VB
0VB	WG21 / WHBU	XZ1/X11: 0 XZ1/X11: 0V
24VA	WG21 / BK	XZ1/X11: VA
0VA	WG21 / PKBN	XZ1/X11: 0V
0VA	WG21 / PUR	XZ1/X11: 0V

I/O module

I/O module XD1 / illustration similar

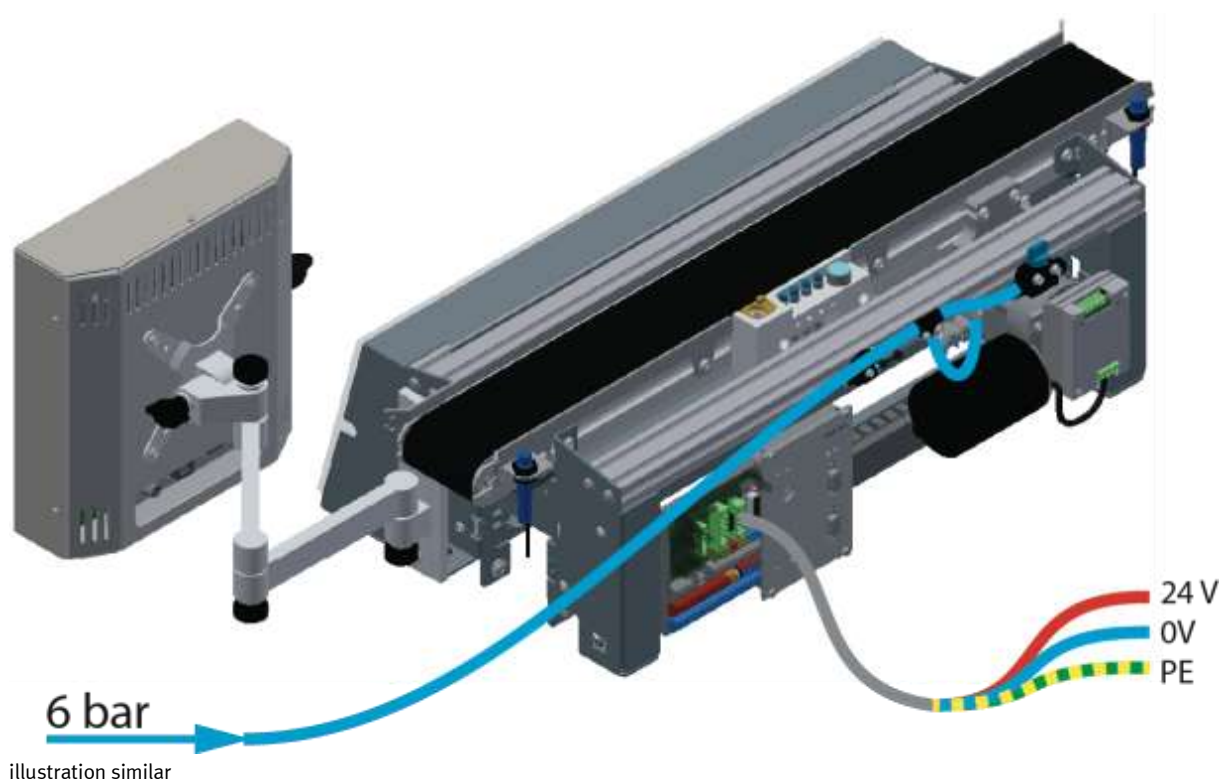
XZ1 out	XD1 in	XD1 out	To application
X11 - VB	XG1: 24VB	XJ1:22	APP_24VB
X11: 0V	XG1: 0VB	XJ1:23	APP_24VB
X11: VA	XG1: 24VA	XJ1:10	APP_24VB
X11: 0V	XG1: 0VA	XJ1:11+12	APP_24VB
X14:1	XG1:1 / I0	XJ1:13	APP_DI0
X14:2	XG1:2 / I1	XJ1:14	APP_DI1
X14:3	XG1:3 / I2	XJ1:15	APP_DI2
X14:4	XG1:4 / I3	XJ1:16	APP_DI3
X14:5	XG1:5 / I4	XJ1:17	APP_DI4
X14:6	XG1:6 / I5	XJ1:18	APP_DI5
X14:7	XG1:7 / I6	XJ1:19	APP_DI6
X14:8	XG1:8 / I7	XJ1:20	APP_DI7
X15:1	XG1:9 / O0	XJ1:1	APP_DO0
X15:2	XG1:10 / O1	XJ1:2	APP_DO1
X15:3	XG1:11 / O2	XJ1:3	APP_DO2
X15:4	XG1:12 / O3	XJ1:4	APP_DO3
X15:5	XG1:13 / O4	XJ1:5	APP_DO4
X15:6	XG1:14 / O5	XJ1:6	APP_DO5
X15:7	XG1:15 / O6	XJ1:7	APP_DO6
X15:8	XG1:16 / O7	XJ1:8	APP_DO7

8.6 Commissioning

	<div style="text-align: center; background-color: #e67e22; color: white; padding: 5px; margin-bottom: 10px;">  WARNING </div> <ul style="list-style-type: none"> • Danger of being pulled in at the conveyors <ul style="list-style-type: none"> – When the automatic mode starts, the belts of the conveyor belts start to move, creating a risk of being pulled in. – When starting, do not stand directly at the ends of the belt or hold on to them, keep enough distance. – Failure to heed the information given can lead to injuries.
-----------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

For the CP Lab conveyor, an initial start-up has been made ex works.

Please follow the following instructions in order to be able to work with CP Lab conveyor as well as with a possibly present application:



1. CP-L-CONV with 24 V DC motor: Connect the power supply 230 V AC for the power supply unit and connect the 24 V supply cable of the module.

CP-L-CONV with 230 V AC motor and G120 Edutainer: Connect the the supply unit Edutainer with 230 V. Connect the 24 V supply calbe of the module and connect the the supply cable of the G120.

CP-L-CONV with 400 V AC motor and G120 Edutainer: Connect the the supply unit Edutainer with 400 V. Connect the 24 V supply calbe of the module and connect the the supply cable of the G120.

2. The power supply is correctly connected to the CP Lab conveyor, but not yet switched on yet.
3. The CP Lab conveyor is supplied with approx. 6 bar compressed air. When commissioning for the first time, make sure to increase the pressure slowly. This prevents unpredictable events.
4. All EMERGENCY STOP signaling devices (pushbutton, door contact, light barriers, etc.) are not actuated or activated and unlocked.
5. Check any installed application for visual damage and repair if necessary
6. Remove workpieces
7. For CP-L-CONV with 24 V DC motor: Switch on the power supply to the power supply unit.
For CP-L-CONV with 230 V AC motor and G120 Edutainer: Switch on the Edutainer and G120 supply unit.
For CP-L-CONV with 400 V AC motor and G120 Edutainer: Switch on the Edutainer and G120 supply unit.
8. The HMI (touch panel) is started and starts up
9. Illuminated button Q1 on the control panel flashes
10. Press illuminated button Q1
11. Q1 illuminated pushbutton lights up.
12. Acknowledge the error message on the HMI
13. On the HMI, select the straightening mode and press the straightening button
14. Select Automatic on the HMI and press the Automatic button

9 Operation

The operation is explained with the help of an example. There might be deviations with other applications.

9.1 Starting the station

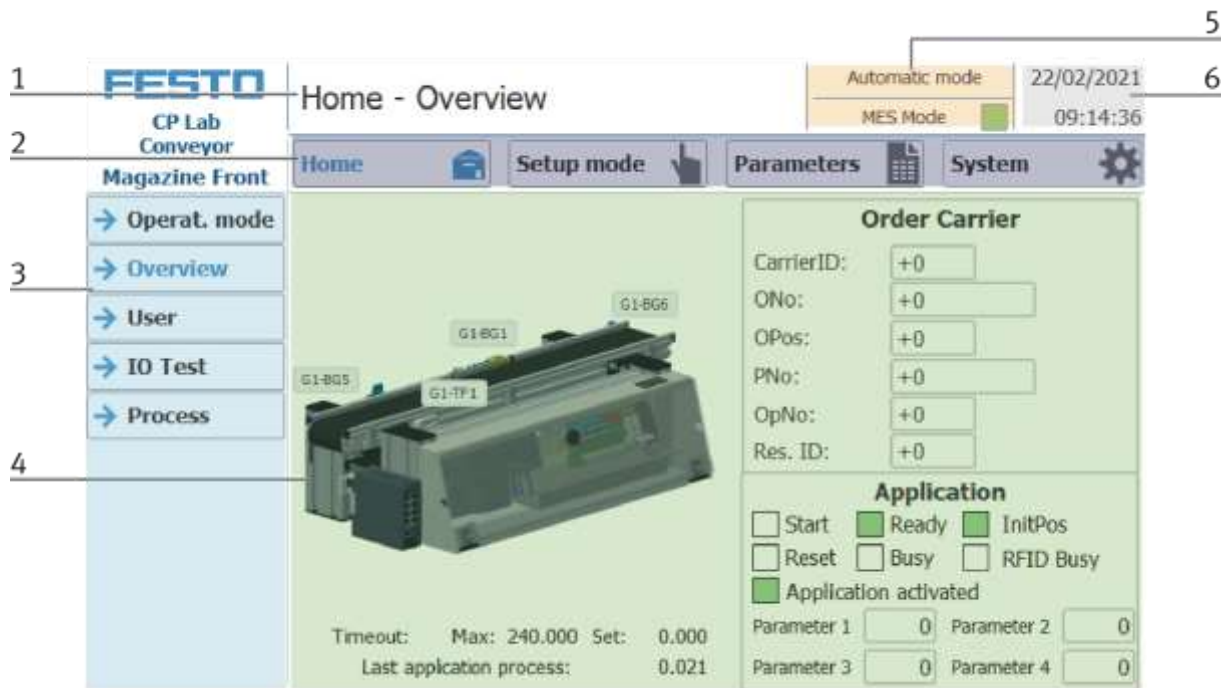
An initial commissioning has already been carried out ex works for the station.

Follow these steps to work with the station and the applications:

1. Establish mains supply 230 V AC.
2. The system is supplied with approx. 6 bar compressed air. When commissioning for the first time, make sure to increase the pressure slowly. (Prevents unpredictable events).
3. Now you can work with the system.

9.2 Menu architecture from operation panel

This description serves as an example; it is made with a base module and an application module magazine. Some of the functions are not available if there is no or other application module mounted.



Position	Description
1	Description of menu (main or submenu) OR in case of an active Error or an error message, this field is also for announcement
2	<p>Main menu (always shown the same)</p> <p>Home: Here the module can be controlled, the mode (default / MES) can be selected, the automatic or the set-up mode can also be operated.</p> <p>Setup: Here, the application can be operated manually in setup mode</p> <p>Parameter: The parameters of the application are set here, a simulation can be started, the transitions can be defined, or the tape can be set</p> <p>System: Here the system parameters such as language, time, etc. are set</p>
3	<p>Submenu</p> <p>Changing content, depending on the main menu</p>
4	Changing content, depending on the main or submenu
5	Announcement of operation mode or mode (MES or default)
6	Announcement of actual date and time

Log in as an administrator

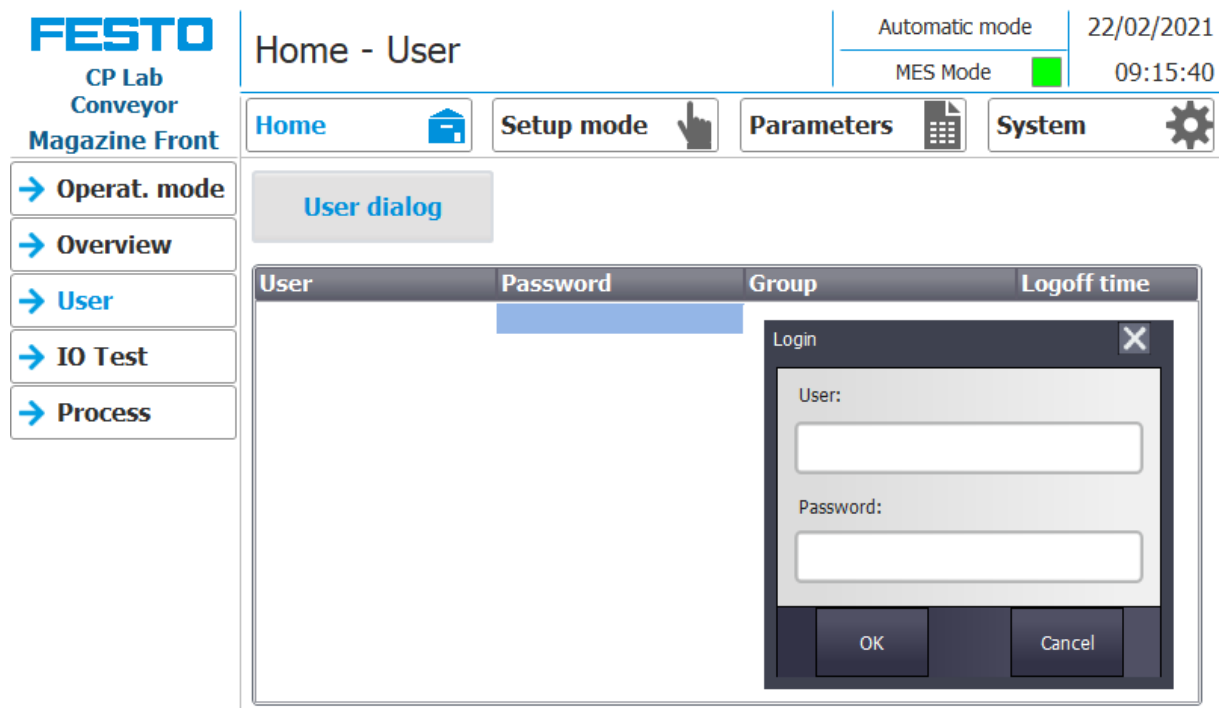
There are 2 functions in the operation of the HMI that are only available when the operator logs on to the HMI. These functions are the I/O test in the setup mode and the user area.

If one of the functions has been logged in, the other function is also available without the user having to log in again.

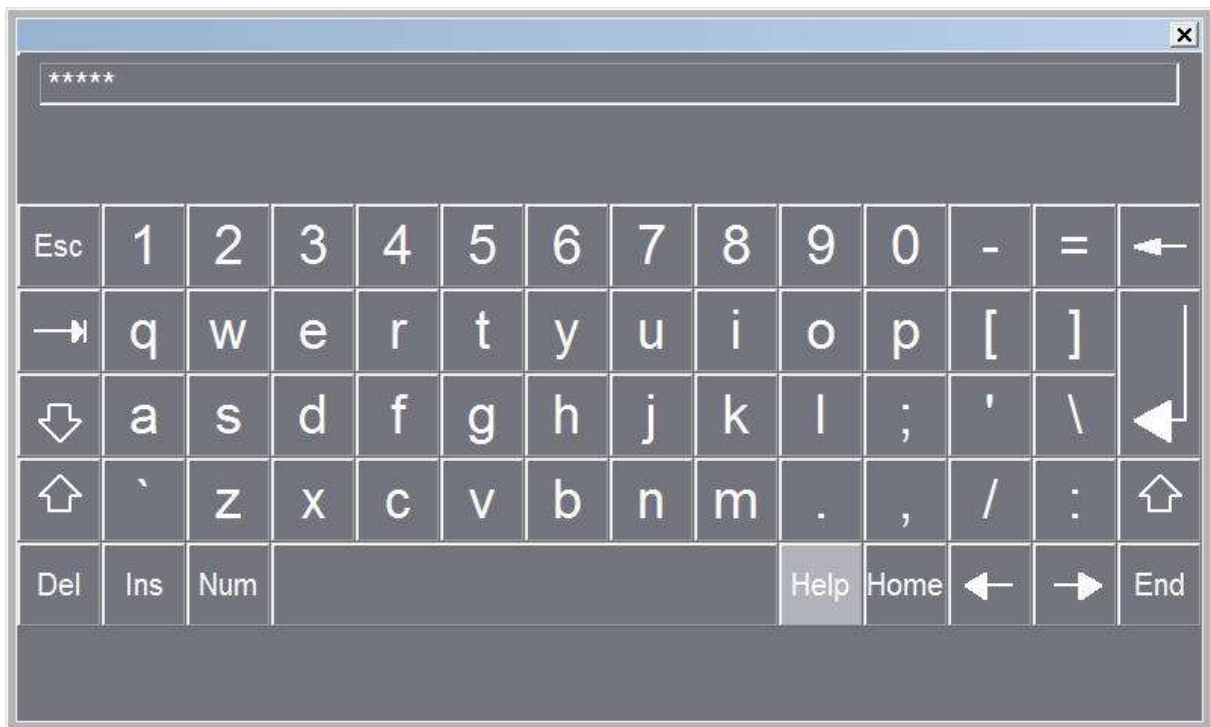
The process is explained using the user function as an example.



1. The following window opens with a click on the User dialog button.




2. If you click in the User and / or Password fields, the input window opens and the user data can be entered.



3. Here the user data can be entered with the return key the entry is confirmed.

User: festo

Password: festo





**CP Lab
Conveyor
Magazine Front**


Home - User


Automatic mode 22/02/2021

MES Mode ■ 09:16:51

Home 

Setup mode 

Parameters 

System 

User dialog

User	Password	Group	Logoff time
festo	*****	Users	5

4. The user is now logged in as "Administrator" and the functions User and I / O test are available.

9.3 Operation modes

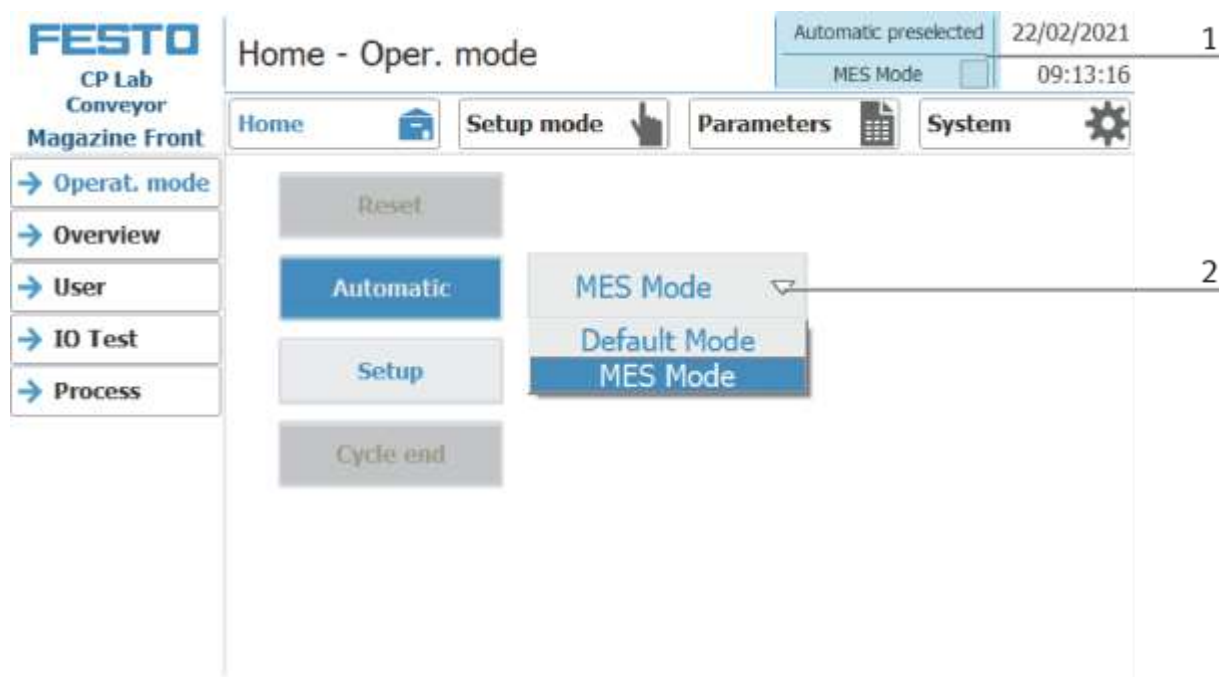
The following operation modes are available

- Reset
The station is moved to its home position
- Setup
The station runs in set-up mode, actuators can be controlled and monitored
- Automatic
The station runs in automatic mode, all processes run automatically, no actuators can be controlled.
There are two modes in the automatic mode: the default mode and the MES mode.

9.3.1 Mode

The mode can be set between MES and default, there are two ways to set it.

1. Clicking on the blue marked area opens a pop-up window in which the operating mode can be selected. Other functions are also integrated in the pop-up.
2. The mode can also be set on the Home / Operating mode page.



Possibilities of mode

- MES mode
In the MES mode, all processes are centrally started, executed and monitored by the MES software. All stations must be set to MES mode and automatic start.
- Default Mode
The automatic sequence is not centrally controlled in the default mode, all information from the transition tables (see chapter "Schematic process flow") is read and processed separately at each station.

Display MES Mode

Various states are displayed in the Home operating mode on the Overview page.



Position	Description
1	Change to sub menu Overview
2	Display of various information about the station
3	Display operation state MES is active
4	Display of the order data of the current carrier
5	Display of various functions (marked green if active) and its parameters

Display Default mode

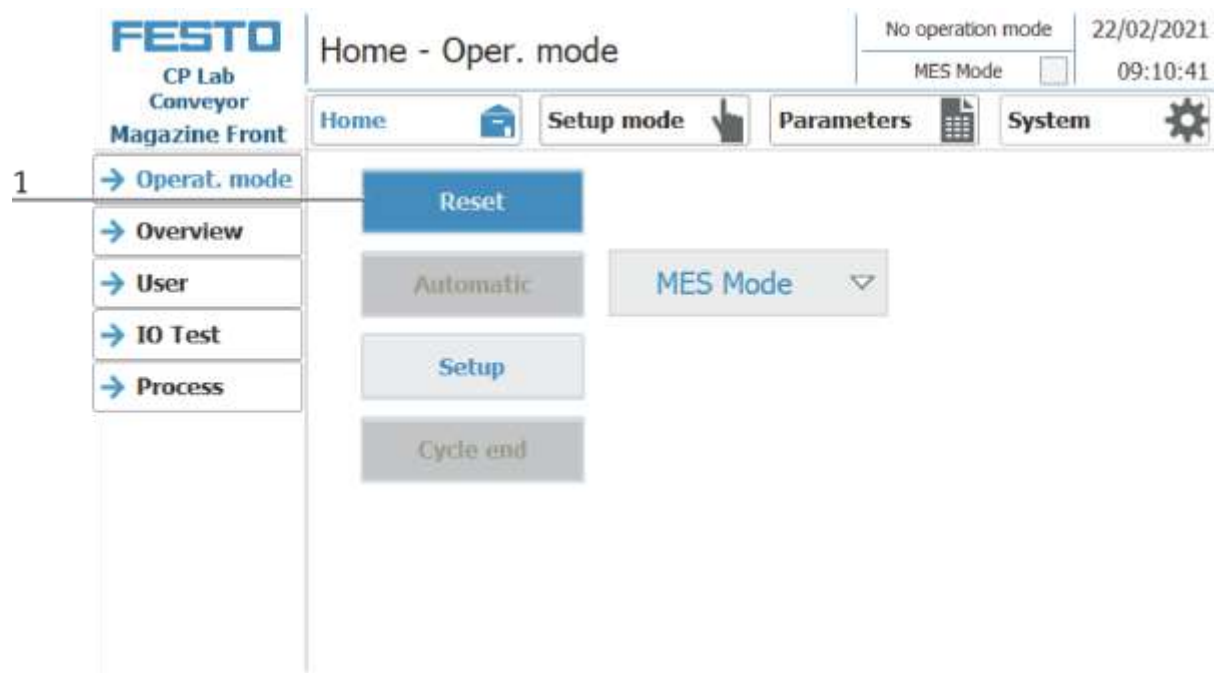
Various states are displayed in the Home operating mode on the Overview page.



Position	Description
1	Change to sub menu Overview
2	Display of various information about the station
3	Display default mode is active
4	Display of Order carrier (RFID statecode)
5	Display of various functions (marked green if active) and its parameters

9.3.2 Operation mode Reset

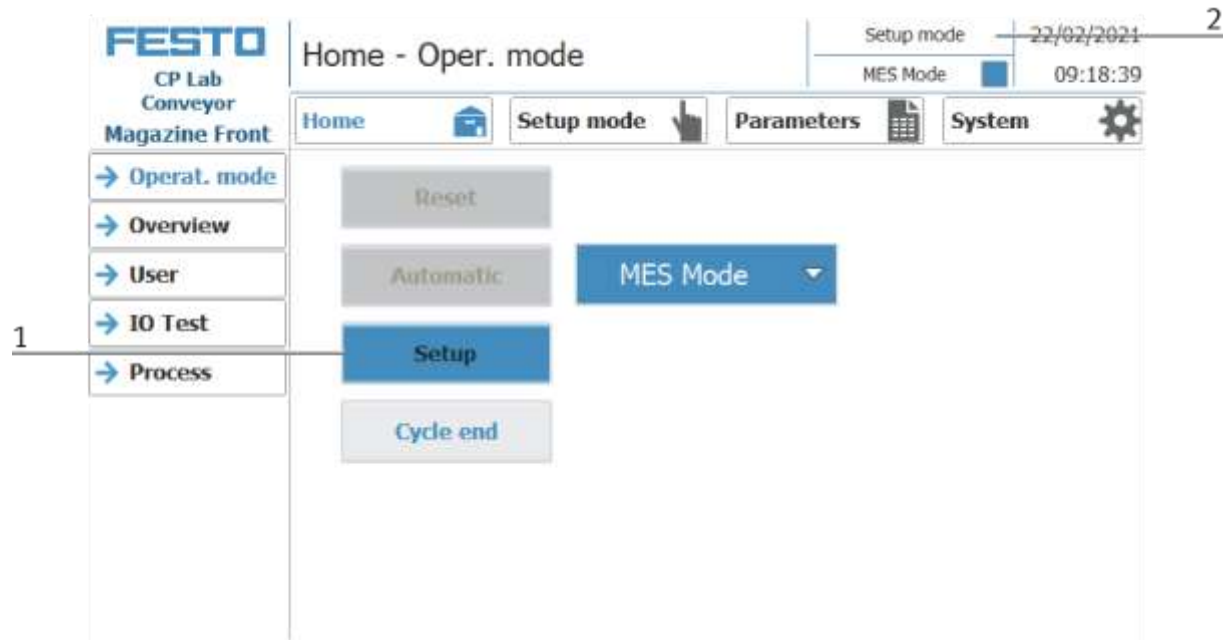
In the operation mode Reset, the station is moved to its home position.



1. After switching on the station, the Reset button flashes, press this to move the station into its home position.
2. The operating mode Reset is displayed here during the process.

9.3.3 Operation mode Setup

In operation mode Setup, all sensors can be displayed and actuators can be controlled from the HMI. This is used for troubleshooting or during commissioning.



1. Automatic mode is not active and the Setup button is not greyed out - press the Setup button to activate the Setup mode.
2. The current operation mode is displayed here

Set up application

1. Click the Setup mode button
2. Select application - the currently installed application is always displayed here. In the example, this would be the application module magazine. The content of this page changes depending on the installed application module. The description of the functions is described in the operating instructions for the application modules. Here the magazine is used as an example.

FESTO
CP Lab
Conveyor

Setup - Application

Setup mode 22/02/2021
MES Mode 09:21:27


1 Home Setup mode Parameters System

2 → Application
→ Belt
→ Stopper

lift (CL_MB1)	CL_BG1	Lifting cyl.	CL_BG2	lower (CL_MB2)
00000ms		83		10000ms
open (CL_MB3)	CL_BG3	Separator	CL_BG4	close (CL_MB4)
00000ms		80		00000ms
unlock (CL_MB5)	CL_MB5	Clamping		
00000ms		97		

0=Magazine empty
Palet available
Front cover available

CL_BG5
CL_BG7
CL_BG8



FESTO
CP Lab
Conveyor
Magazine Front

Setup - Application

Setup mode 22/02/2021
MES Mode 09:21:27

Home Setup mode Parameters System

1 → Application

2 → Belt

3 → Stopper

4


5

6

lift (CL_MB1)	CL_BG1	Lifting cyl.	CL_BG2	lower (CL_MB2)
00000ms		83		10000ms
open (CL_MB3)	CL_BG3	Separator	CL_BG4	close (CL_MB4)
00000ms		80		00000ms
unlock (CL_MB5)	CL_MB5	Clamping		
00000ms		97		

0=Magazine empty
Palet available
Front cover available

CL_BG5
CL_BG7
CL_BG8

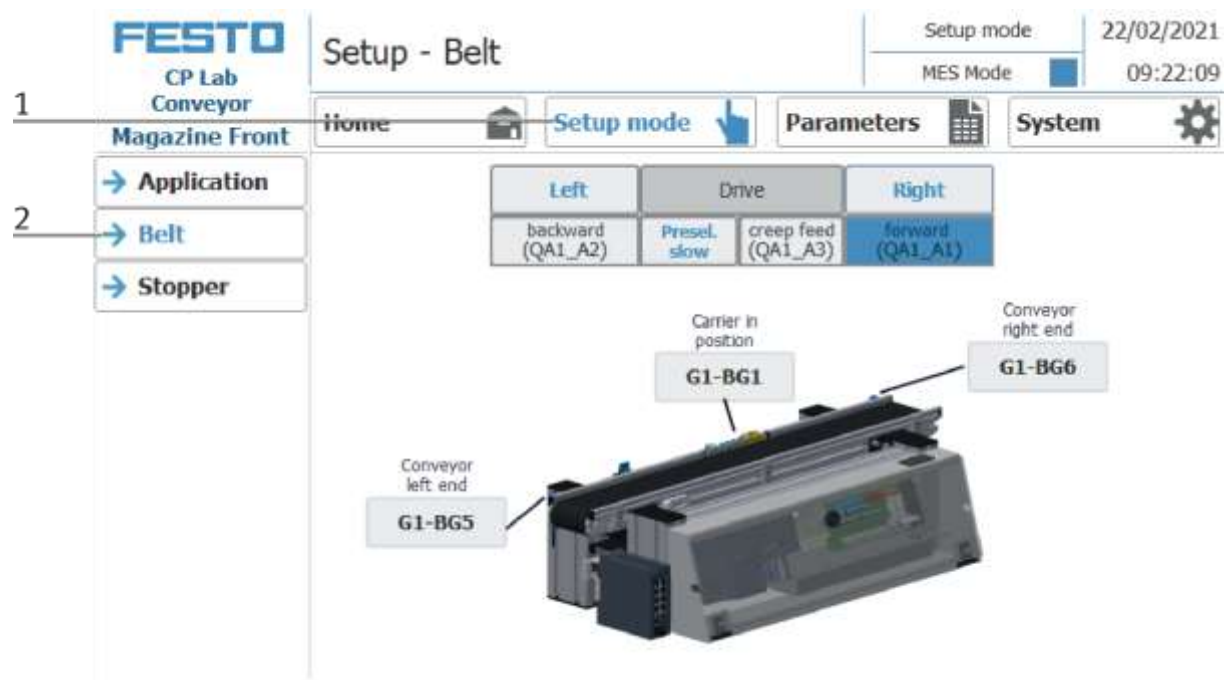


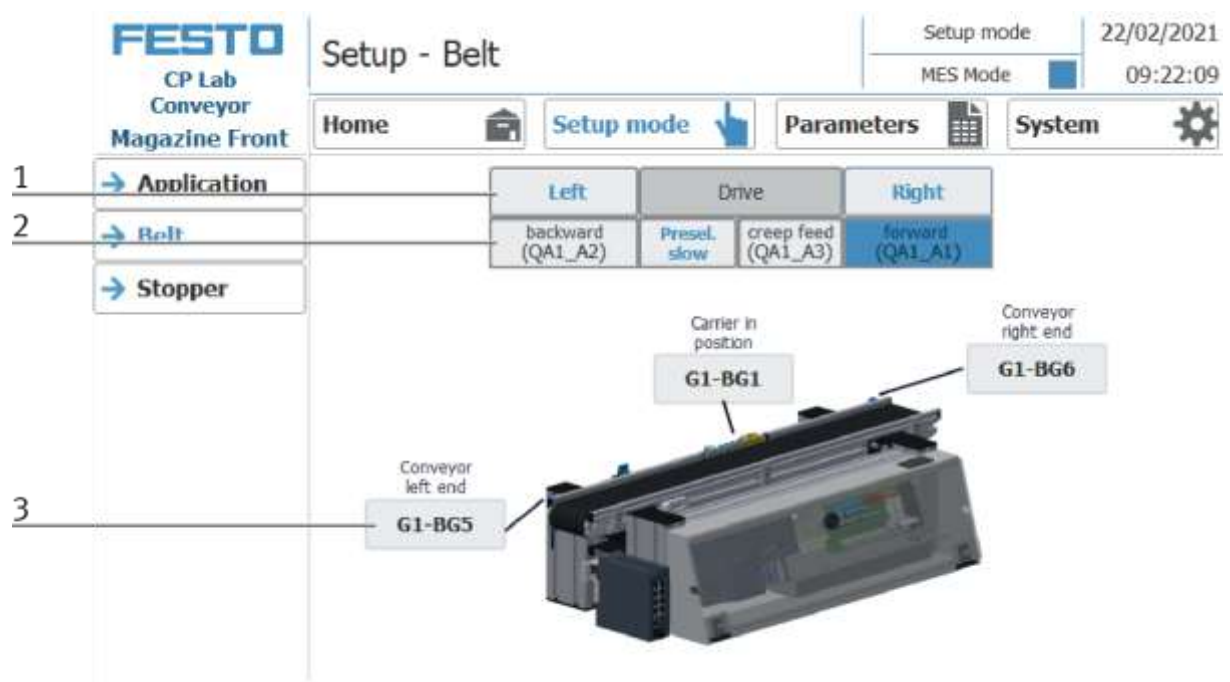
The functions can be activated in the Setup menu under Application by clicking the buttons.

Position	Description
1	Move lifting cylinder (Z-axis) Lift: Move the Z axis up (actuator CL_MB1 is activated, lights up blue when active) CL_BG1: Sensor CL_BG1 Indicator (lights up green when Z axis is up) Lifting cyl: Z axis display CL_BG2: Sensor CL_BG2 indicator (lights up green when Z axis is down) lower: Move the Z axis down (actuator CL_MB2 is activated, lights up blue when active)
2	Separator open: open the separator (actuator CL_MB3 is activated, lights up blue when active) CL_BG3: Sensor CL_BG3 Indicator (lights up green when separator is opened) Separate: Display separator CL_BG4: Sensor CL_BG4 Indicator (lights up green when separator is closed) Close: close separator (actuator CL_MB4 is activated, lights up blue when active)
3	Release the clamp Unlock: Unlocking the clamp (actuator CL_MB5 is activated, lights up blue when active) CL_MB5: Indicator (lights up green when clamp is declamped) Clamp: Display Clamp
4	0 = Magazine empty: Sensor CL_BG5 Display (lights up green when the magazine is empty)
5	Palette / front cover available: Sensor CL_BG7 Indicator (lights up green when a pallet with front cover is installed)
6	Front / back cover available: Sensor CL_BG8 Indicator (lights up green when front / back cover is present)

Setup Belt

1. Click the Setup mode button
2. Select belt - the functions of the conveyor belt are displayed and / or controlled here.





Position number	description
1	Run the conveyor left / right Left: conveyor moves counter clockwise to the left Drive: Display conveyor belt Right: conveyor moves clockwise to the right
2	Backward: Move the conveyor to the left (actuator QA1_A2 is activated, lights up blue when active) Preselection slow: Slowly set the conveyor speed Creep feed: Move the conveyor slowly (actuator QA1_A3 is activated, lights up blue when active) Forward: Move the conveyor to the right (actuator QA1_A1 is activated, lights up blue when active)
3	Sensor G1-BG5 indicator conveyor left end (lights up green when active) Sensor G1-BG1 indicator conveyor carrier in position (lights up green when active) Sensor G1-BG6 indicator conveyor right end (lights up green when active)

Setup Stopper

1. Click the Setup mode button
2. Select stopper - the functions of the stopper position are displayed and / or controlled here.

FESTO
CP Lab
Conveyor

Setup - Stopper

Setup mode 22/02/2021
MES Mode 09:22:28

1 **Home** **Setup mode** **Parameters** **System**

Magazine Front

→ **Application**

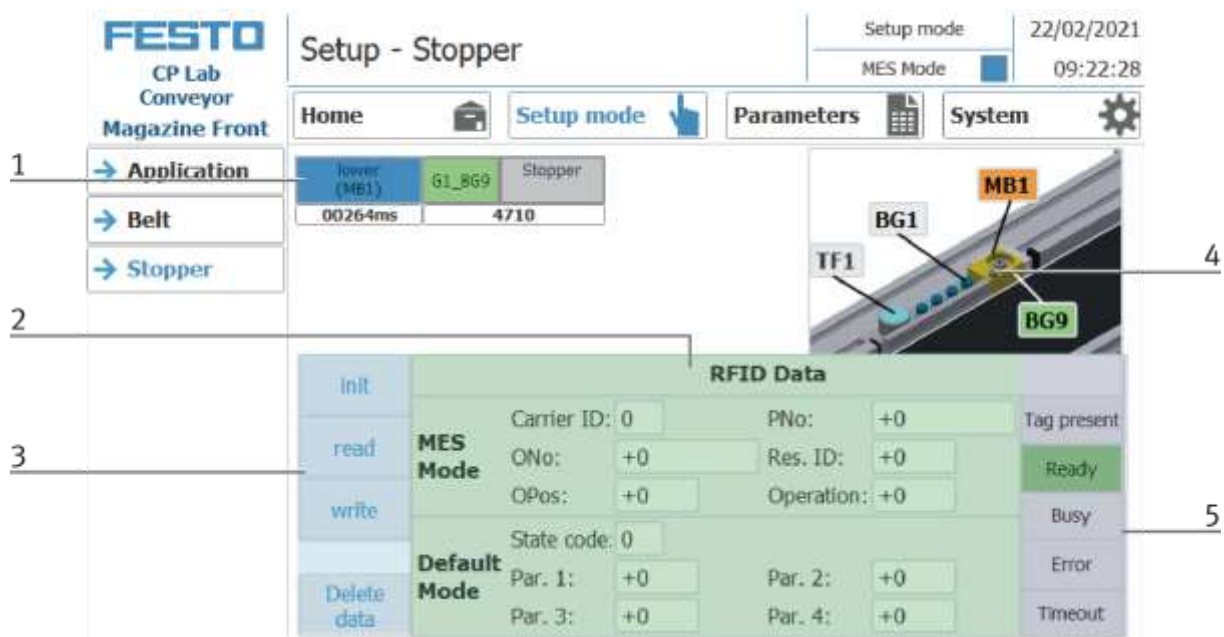
→ **Belt**

2 → **Stopper**

Position	Time
TF1	00264ms
BG1	4710
MB1	
BG9	

RFID Data

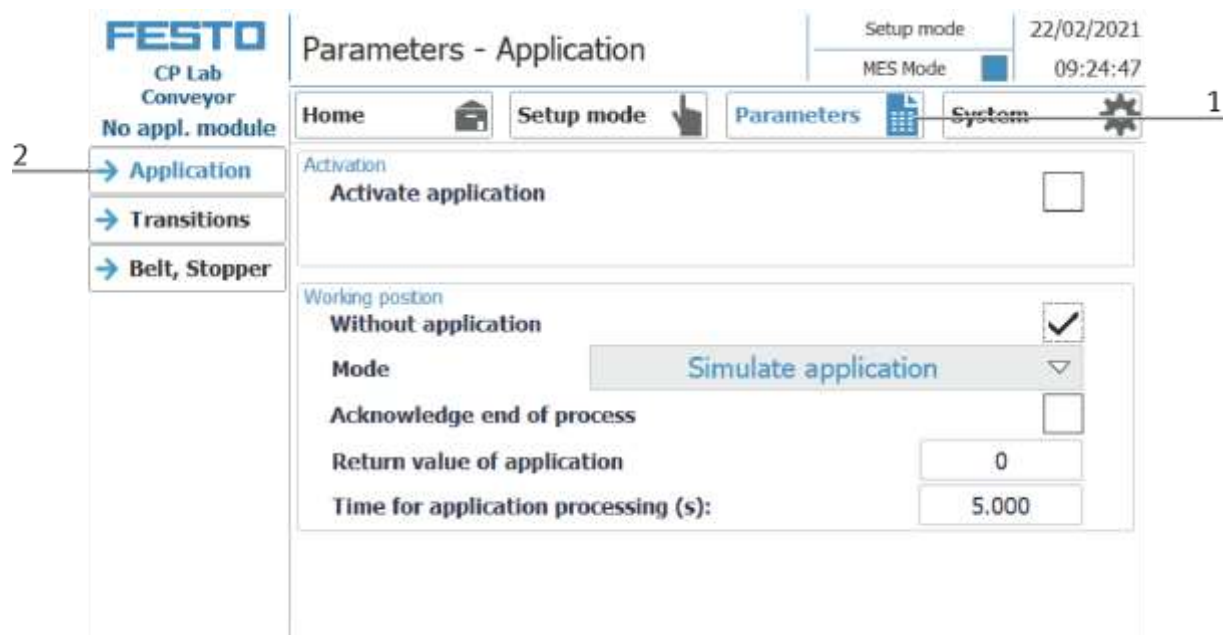
Init	Carrier ID: 0	PNo: +0	Tag present
read	ONo: +0	Res. ID: +0	Ready
write	OPos: +0	Operation: +0	Busy
Delete data	State code: 0		Error
	Par. 1: +0	Par. 2: +0	Timeout
	Par. 3: +0	Par. 4: +0	



Position number	description
1	Move down the stopper Lower: Move stopper down (actuator MB1 is activated, lights up blue when active) G1_BG9: Sensor G1_BG9 Stopper lowered (lit green when active) Stopper: Indicator stopper
2	RFID area MES Mode: Displays the job data Default Mode: Displays the RFID status
3	Write and read RFID area Initialize: Set RFID data to zero read: Read RFID data write: Write current data on RFID Delete data: all data in the input mask are deleted - not directly on the RFID (for easier entry)
4	Range Display of the active sensors (lit green when active) and actuators (lit orange when active) at the stopper
5	Display of RFID reading status

Set up application parameters

1. Click on the Parameter button
2. Select application - the parameters of the application can now be set up here.



FESTO
CP Lab
Conveyor
No appl. module

Parameters - Application

Setup mode 22/02/2021
MES Mode 09:24:47

Home Setup mode Parameters System

→ Application
→ Transitions
→ Belt, Stopper

Activation
Activate application ☐ 1

Working position
Without application ☒ 2

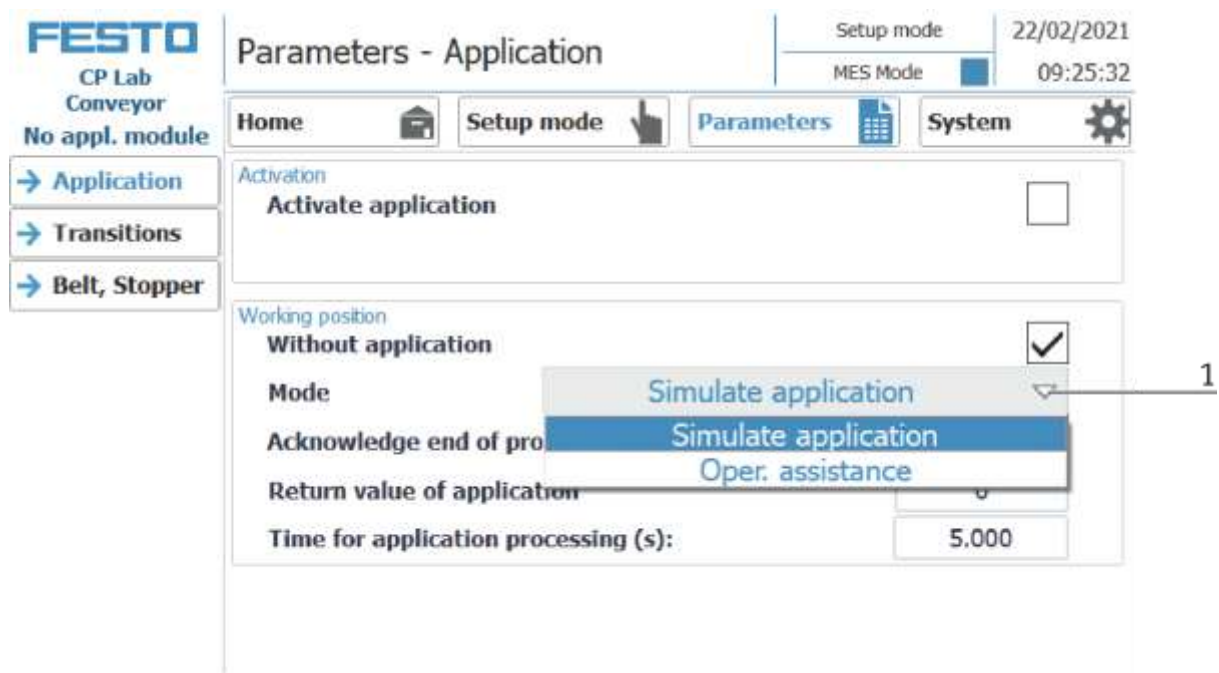
Mode **Simulate application** 3

Acknowledge end of process ☐ 4

Return value of application 0 5

Time for application processing (s): 5.000 6

Position number	description
1	Here the application module can be activated (tick set). If no application module is activated, the carrier is stopped at the stopper and released again without processing.
2	Here you can specify whether the station should be operated without an application module. If a check is placed here, the application module is not used. In this case there are two options, operator guidance or a simulation of the application. This function is helpful if the application module is not available, but the function is to be integrated into a process. See chapter operator assistance and process simulation on a free AP
3	Here it can be determined in simulation mode whether a operator assistance or the application module should be simulated. See chapter operator assistance and simulate application on free AP
4	If the processing end is to be confirmed, a check mark must be set here. The process is only continued if this has been confirmed at the HMI, otherwise the process is automatically continued after the end of processing.
5	The desired return value can be entered here
6	Here you can enter the time required for the simulation.

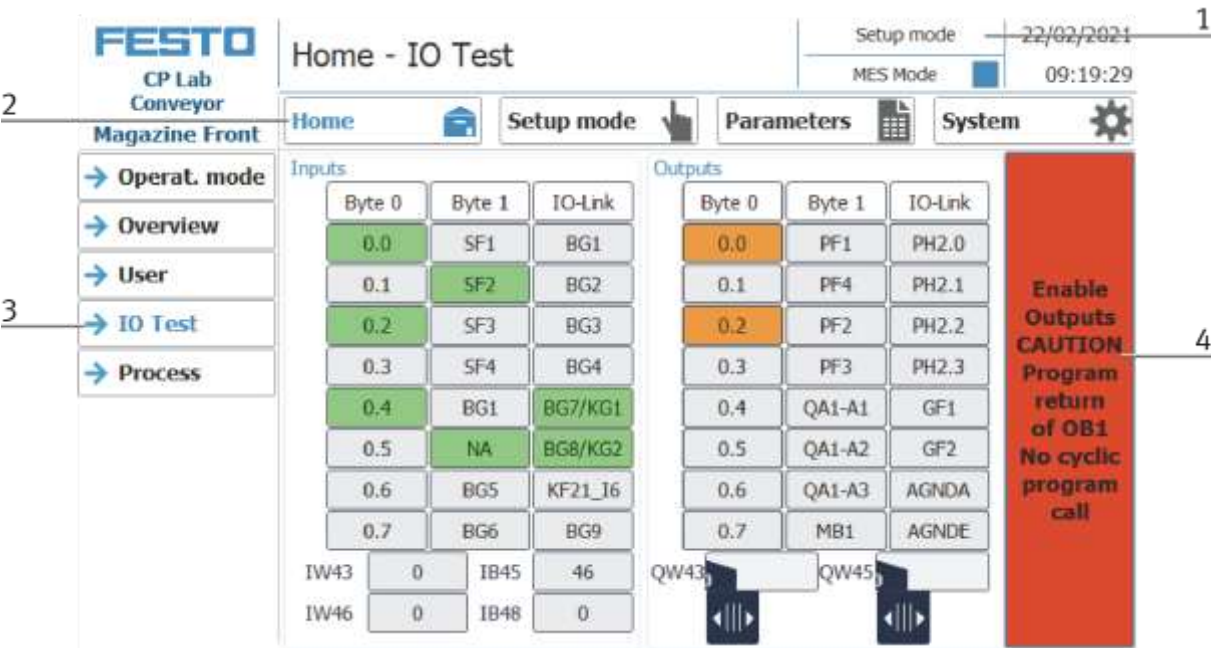


1. Choice between

Simulate application - no application is activated, an automatic process is simulated. The processing time for the simulation can be specified in this window.

and worker guidance. (See chapter worker guidance)

I/O Test



Position number	Description
1	Setup mode must be active
2	Choose Home
3	Choose I/O Test
4	By clicking in this area, the outputs are enabled and can be activated. A login as "Administrator" is required.

FESTO
CP Lab
Conveyor
Magazine Front

Home - IO Test

Setup mode 22/02/2021
MES Mode 09:19:50

Home Setup mode Parameters System

→ Operat. mode
→ Overview
→ User
→ IO Test
→ Process

Inputs

Byte 0	Byte 1	IO-Link
0.0	SF1	BG1
0.1	SF2	BG2
0.2	SF3	BG3
0.3	SF4	BG4
0.4	BG1	BG7/KG1
0.5	NA	BG8/KG2
0.6	BG5	KF21_I6
0.7	BG6	BG9

IW43 0 IB45 46
IW46 0 IB48 0

Outputs

Byte 0	Byte 1	IO-Link
0.0	PF1	PH2.0
0.1	PF4	PH2.1
0.2	PF2	PH2.2
0.3	PF3	PH2.3
0.4	QA1-A1	GF1
0.5	QA1-A2	GF2
0.6	QA1-A3	AGNDA
0.7	MB1	AGNDE

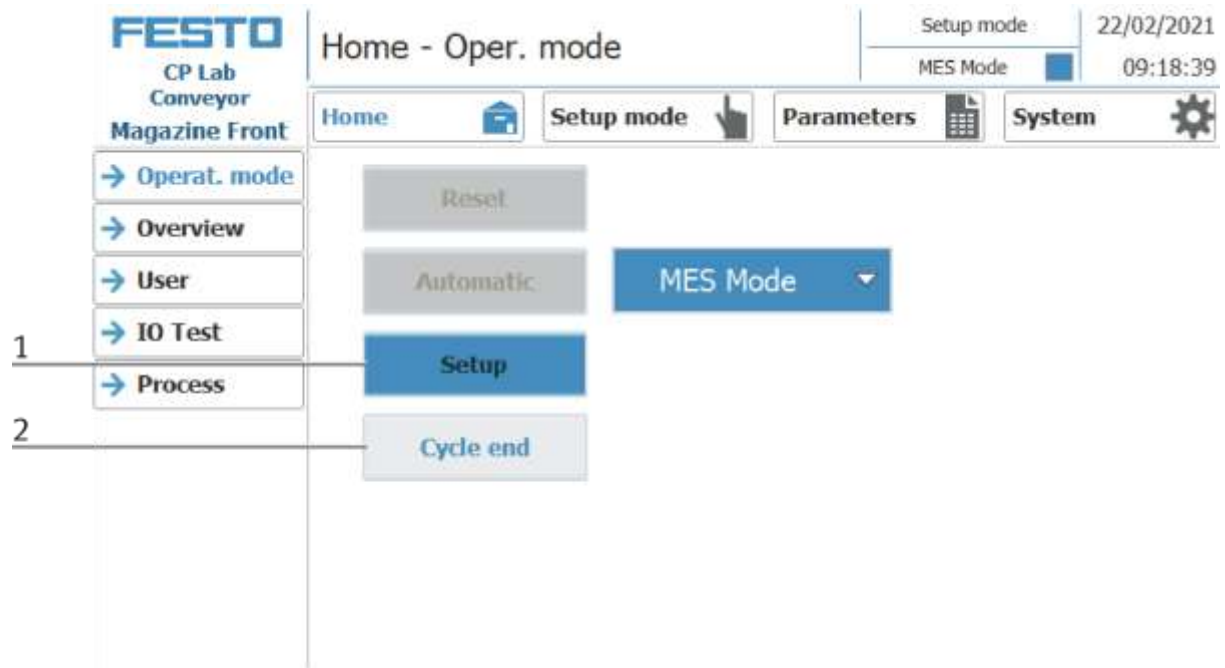
QW43 19090 QW45 12836

**Enable Outputs
CAUTION
Program return of OB1
No cyclic program call**

1
2
3

Position number	Description
1	By clicking in a field, this digital output is activated (orange if active)
2	By clicking again in this field, the outputs are blocked again
4	These controllers can be used to set values for the analog outputs (blue when active, the value is displayed above the controller).

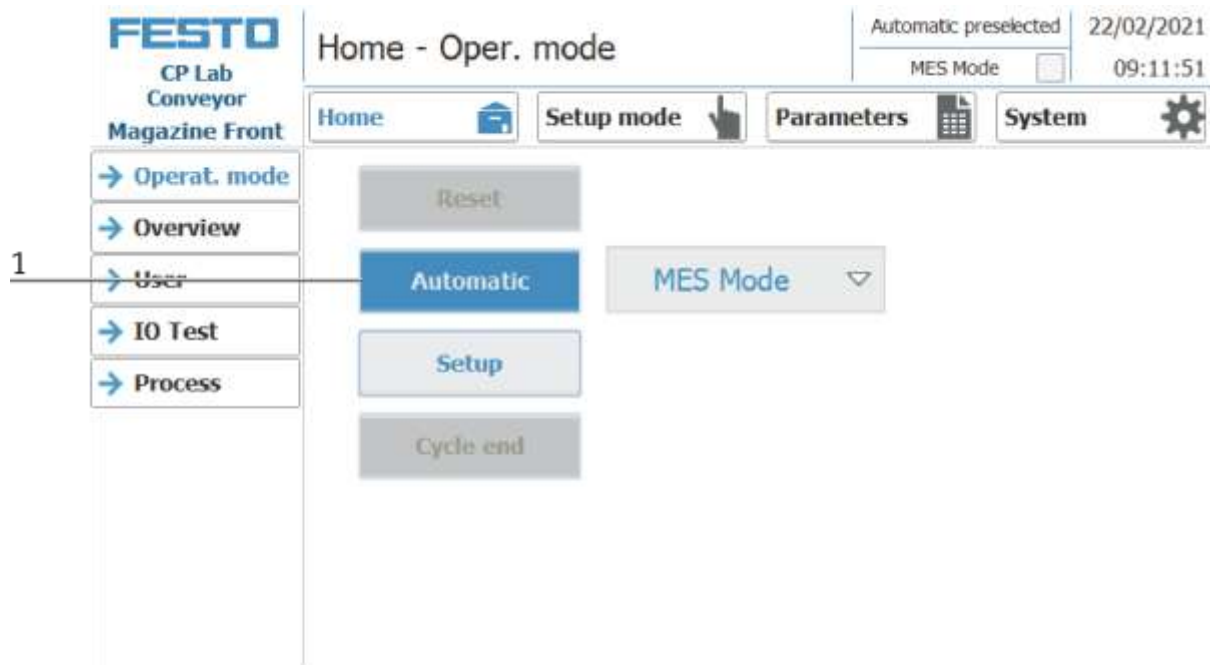
Exit operation mode setup



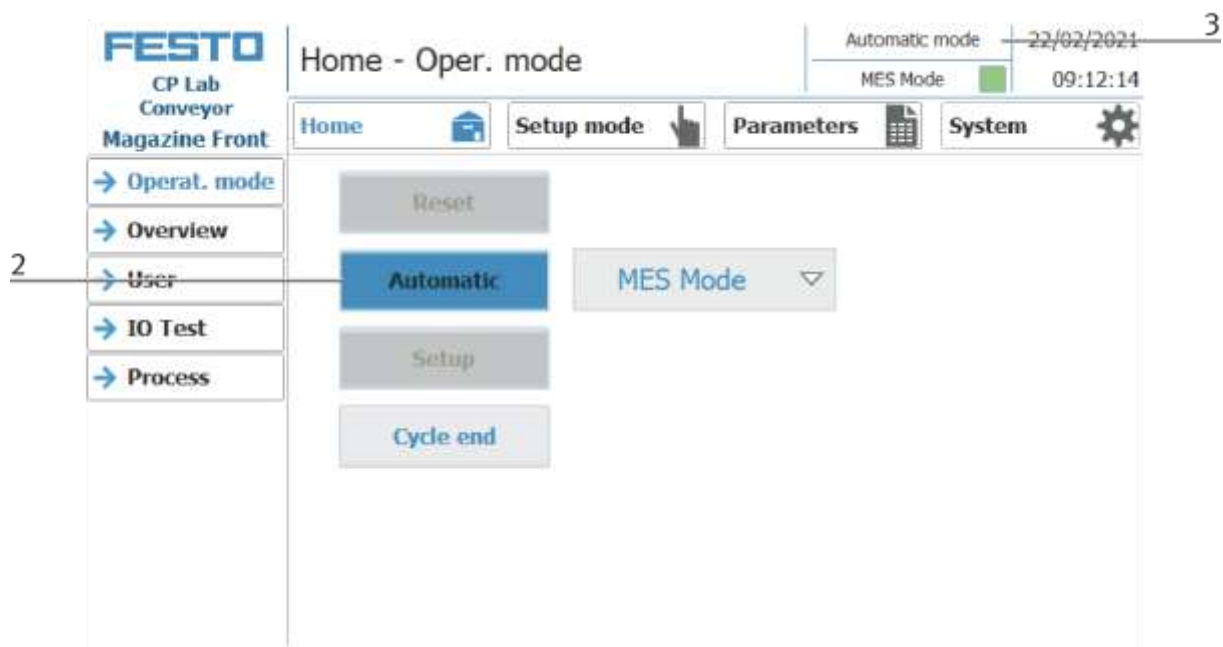
1. Setup mode is active, button lights up blue
2. Press the cycle end button to end the operation mode setup.

9.3.4 Operation mode automatic

In automatic mode, the chosen automatic processes can be processed at the station. Depending on the selection of the mode, the processes are controlled via the transition tables (default) or via MES.



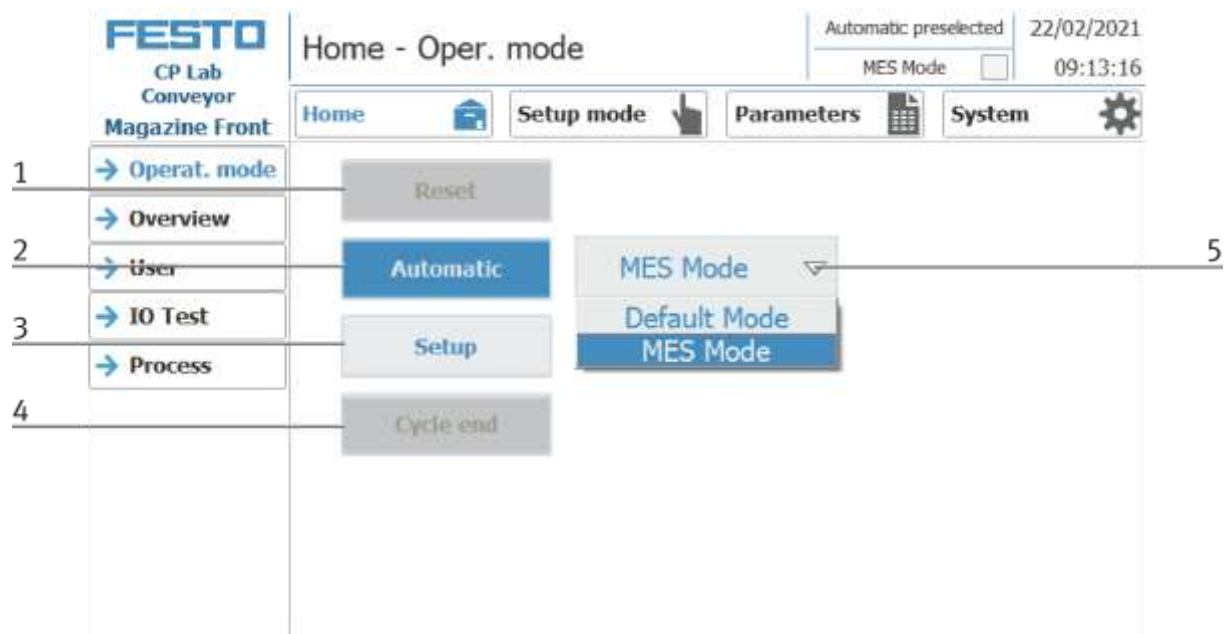
1. Automatic button flashing blue – Press Button to activate operation mode automatic



2. Operation mode automatic is active, button lights up blue
3. Announcement of active operation mode automatic

9.3.5 Main menu - Home

Sub menu operation mode

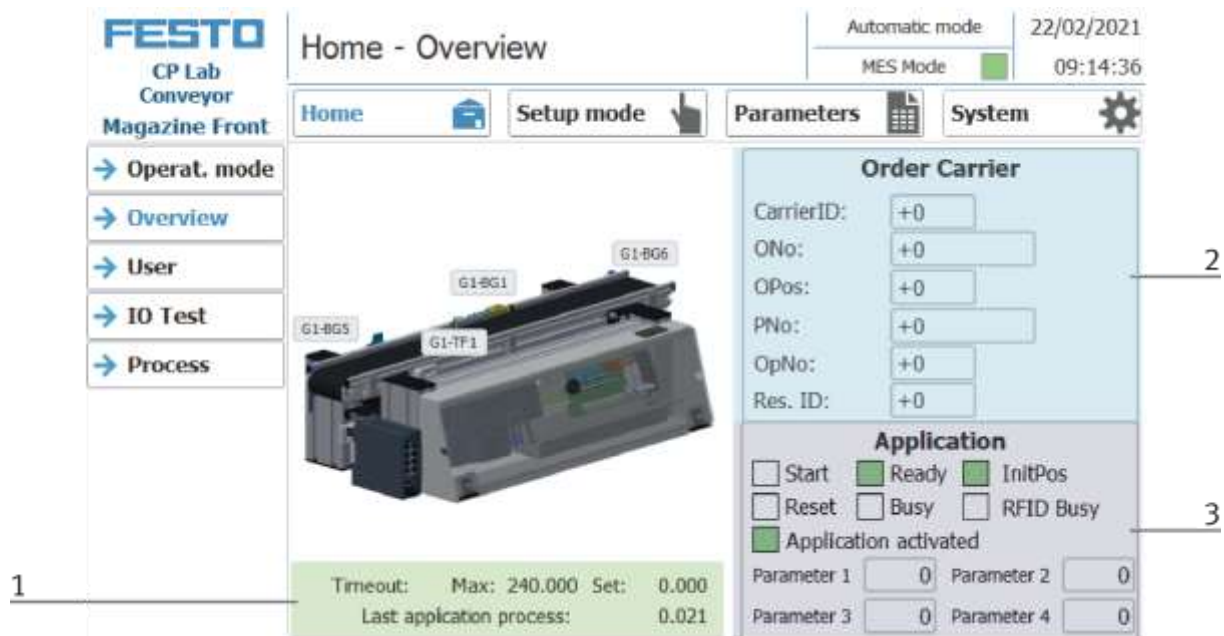


In the operation mode Home, the operating mode and the mode (MES or default) can be selected and started.

Position	Description
1	Reset button: Start reset sequence
2	Automatic button: the automatic sequence in dependent from the mode (Default/MES) is started here
3	Setup button: Here the application module can be controlled manually and sensors can be displayed. Suitable for commissioning an application module or for troubleshooting. There is no difference in mode - setup mode is independent of default or MES mode.
4	Cycle end button: The currently active operating mode is stopped here.
5	Selection of the mode: Default - automatic sequence is processed with the stored transitions MES - automatic process is completely controlled by MES software

Submenu overview

Various states are displayed in the operation mode home on the Overview page.
(changing content depending on the selected operating mode)



Position	Description
1	Display of various information about the station
2	Display of the order data of the current carrier
3	Display of various functions (marked green if active) and its parameters

FESTO
CP Lab
Conveyor
Magazine Front

Conveyor Stop by Sensor / Energy-Mode: conveyor belt instance Drive1 is stopped!

Automatic mode 22/02/2021
MES Mode ■ 09:29:37

Home Setup mode Parameters System

→ Operat. mode
→ Overview
→ User
→ IO Test
→ Process

Time	Date	Status	Text
09:29:13	22/02/2021	K	Conveyor Stop by Sensor / Energy-Mode: conveyor belt instance Drive1 is stopped!

Error messages are also displayed in the overview window.


Sub menu user


Different users can be created here. The function is independent of the selected mode (MES - or default)


FESTO
 CP Lab
 Conveyor
 Magazine Front


Home - User

Automatic mode 22/02/2021
 MES Mode ■ 09:16:51

Home 

Setup mode 

Parameters 

System 

→ Operat. mode

→ Overview

→ User

→ IO Test

→ Process

User dialog

User	Password	Group	Logoff time
festo	*****	Users	5

Display / editing of all users, a login as "Administrator" is required.

Sub menu I/O Test

The inputs / outputs are displayed here. The outputs can also be activated in setup mode.

FESTO
 CP Lab
 Conveyor
 Magazine Front

Home - IO Test

Automatic mode 22/02/2021
 MES Mode ■ 09:17:58

Home
 Setup mode
 Parameters
 System

→ Operat. mode
 → Overview
 → User
 → IO Test
 → Process

Inputs				Outputs			
Byte 0	Byte 1	IO-Link		Byte 0	Byte 1	IO-Link	
0.0	SF1	BG1		0.0	PF1	PH2.0	
0.1	SF2	BG2		0.1	PF4	PH2.1	
0.2	SF3	BG3		0.2	PF2	PH2.2	
0.3	SF4	BG4		0.3	PF3	PH2.3	
0.4	BG1	BG7/KG1		0.4	QA1-A1	GF1	
0.5	NA	BG8/KG2		0.5	QA1-A2	GF2	
0.6	BG5	KF21_I6		0.6	QA1-A3	AGNDA	
0.7	BG6	BG9		0.7	MB1	AGNDE	
IW43	0	IB45	46	QW43		QW45	
IW46	0	IB48	0				

QW43

QW45

◀|||▶

◀|||▶

Enable Outputs
CAUTION
Program return of OB1
No cyclic program call

Sub menu process

Here the process from the application module (if available) is announced.

FESTO
 CP Lab
 Conveyor
 Magazine Front

Home - Process

Automatic mode 22/02/2021
 MES Mode ■ 09:20:38

Home
 Setup mode
 Parameters
 System

→ Operat. mode
 → Overview
 → User
 → IO Test
 → Process

9.3.6 Main menu - Setup


See chapter operation mode setup.

9.3.7 Main menu – Parameter

Submenu application

See chapter operation mode setup.

Sub menu transitions





**CP Lab
Conveyor
Magazine Front**


Parameters - Transitions


Automatic mode
22/02/2021

Default-Mode ■
09:27:04

Home 

Setup mode 

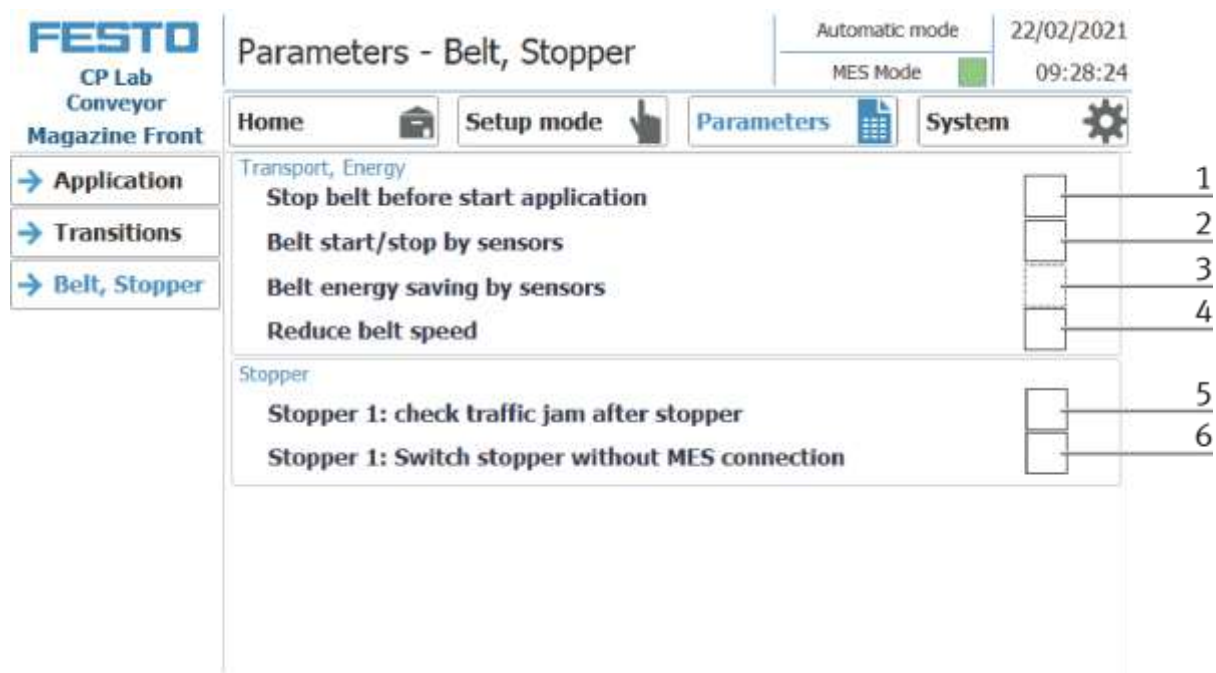
Parameters 

System 

No.	Start condition	Application execute	Parameter				End condition	
			Parameter 1	Parameter 2	Parameter 3	Parameter 4	OK	NOK
Init	none	<input type="checkbox"/>	0	0	0	0	100	0
1	100	<input checked="" type="checkbox"/>	0	0	0	0	200	0
2	0	<input type="checkbox"/>	0	0	0	0	0	0
3	0	<input type="checkbox"/>	0	0	0	0	0	0
4	0	<input type="checkbox"/>	0	0	0	0	0	0
5	0	<input type="checkbox"/>	0	0	0	0	0	0
6	0	<input type="checkbox"/>	0	0	0	0	0	0
7	0	<input type="checkbox"/>	0	0	0	0	0	0
8	0	<input type="checkbox"/>	0	0	0	0	0	0
9	0	<input type="checkbox"/>	0	0	0	0	0	0
10	0	<input type="checkbox"/>	0	0	0	0	0	0

If the sub menu transitions is selected, the transitions of the installed application module are displayed. The transitions of all other application modules can be found in the associated manuals for the application modules.

Sub menu belt, stopper



Position number	description
1	Stop belt before start application: the belt is stopped before the application begins to start
2	Belt Start / Stop by sensors: Hook set when the belt should be switched automatically with the sensors. Switch on when Sensor at belt beginning signals a carrier, switch off when the sensor at the end of the belt signals the carrier passing by
3	Belt energy saving mode with sensors: If no workpiece is detected on the belt via the sensors, the belt is switched off
4	Reduce belt speed: Here the belt speed is reduced to save energy
5	Stopper: Check the jam at the belt outlet: The carrier is only released from the stopper if the belt is not occupied at the belt outlet.
6	Stopper 1: Switch stopper without MES connection Function active MES in – workpiece carriers run through / MES out - workpiece carriers run through constantly Function not active MES in - workpiece carriers run continuously / MES out - workpiece carriers stop

FESTO
 CP Lab
 Conveyor
 Magazine Front

Conveyor Stop by Sensor / Energy-Mode: conveyor belt instance Drive1 is stopped!

Automatic mode 22/02/2021
 MES Mode ■ 09:29:26

→ Application

→ Transitions

→ Belt, Stopper

Home
Setup mode
Parameters
System

Transport, Energy

Stop belt before start application ☐

Belt start/stop by sensors ☐

Belt energy saving by sensors ☒

Reduce belt speed ☐

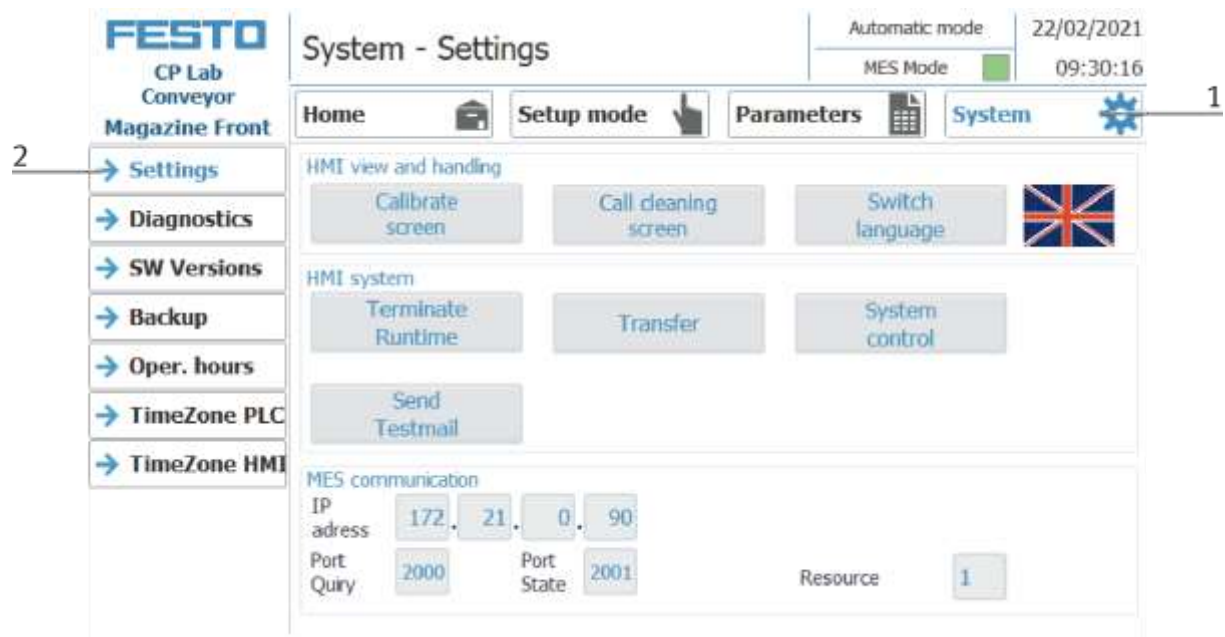
Stopper

Stopper 1: check traffic jam after stopper ☐

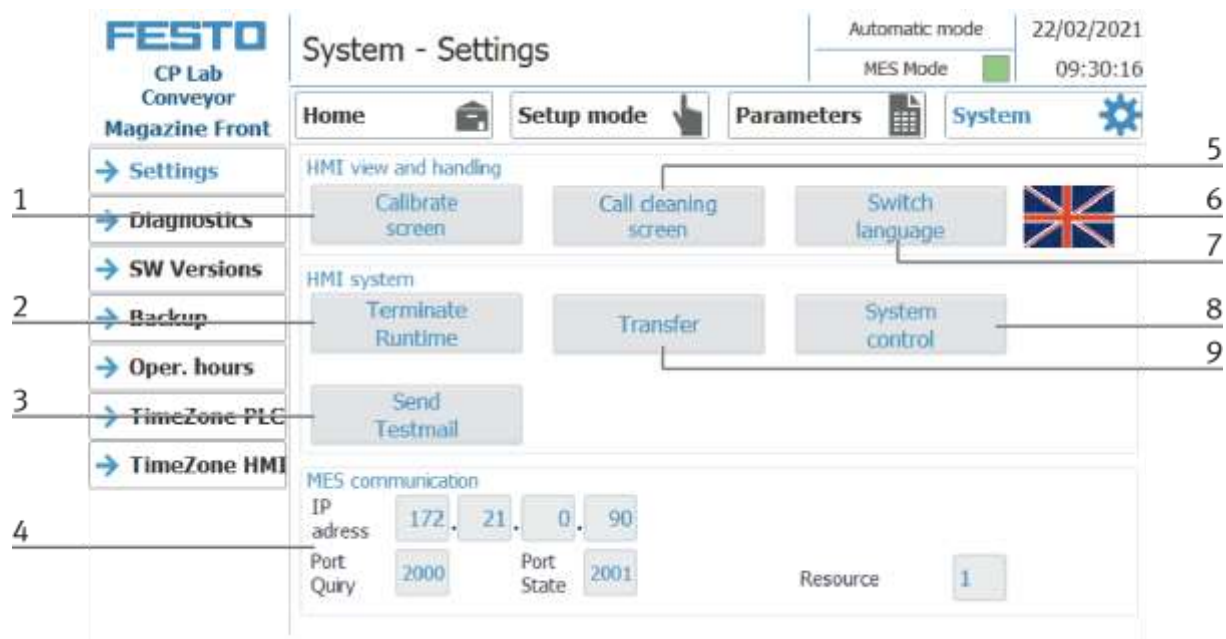
Stopper 1: Switch stopper without MES connection ☐

If the belt energy saving by sensors function is activated and the belts stop when there are no workpiece carriers on the belt, this is displayed in the upper message window.

9.3.8 Main menu – System Sub menu - Settings



1. To get to the system settings, the System button must be selected
2. Click on Settings



The system can be set in this operating mode.

Position number	Description
1	Button Calibrate Screen - If buttons react inaccurately, calibration of the touch screen can be restored
2	Button Terminate Runtime: The runtime is terminated and returned to Windows.
3	Button send test mail – send test mail to eMailserver (all error messages are sent from the hmi to a eMailserver on the MES4 PC – this function is to test if the configuration is ok.)
4	Display of the MES IP address additionally the IP of the MES can be set here. (Password protected) User: festo, PW: festo) Input fields for your own resource number, query port and status port of the MES connection
5	Button call cleaning screen - the screen can be cleaned here. The touch function is interrupted and unintentional operation is excluded
6	Flag displays only current language. By clicking on button next to the flag language can be switched
7	Button switch language: here the language can be changed
8	Button system control: Windows system control is opened
9	Button Transfer: Runtime is closed and the transfer mode of the HMI is called

Sub menu diagnostics

FESTO

CP Lab

Conveyor

Magazine Front

→ Settings

→ **Diagnostics**

→ SW Versions

→ Backup

→ Oper. hours

→ TimeZone PLC

→ TimeZone HMI

System - Diagnostics

Automatic mode22/02/2021

MES Mode09:31:17

Home

Setup mode

Parameters

System

plcConv

Status	Name	Oper...	Slot	Type
✓	plcConv			ET 200SP station
✓	plcLabMagFront	✓	1	CPU 1512SP F...
✓	DI 8x24VDC HF_1		2	DI 8x24VDC HF
✓	DI 8x24VDC HF_1		3	DI 8x24VDC HF
✓	DQ 8x24VDC/0.5A HF_1		4	DQ 8x24VDC/0.
✓	DQ 8x24VDC/0.5A HF_1		5	DQ 8x24VDC/0.
✓	CM 4xIO-Link_1		6	CM 4xIO-Link
✓	Server module 1		7	Server module

Home

←

→

⌂

1

2

3

4

5

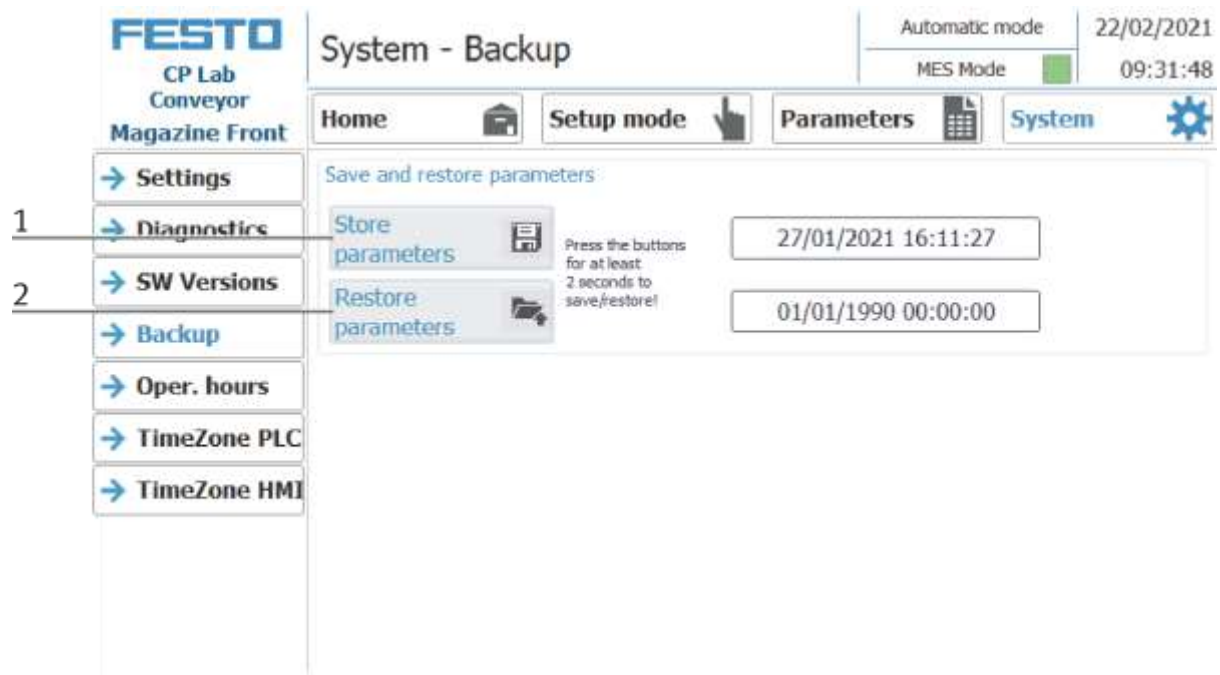
Position number	Description
1	Announcement overview plant
2	Send diagnostic message via mail
3	Next diagnostic message
4	Previous diagnostic message
5	Home Button

Sub menu software versions

The screenshot displays the FESTO CP Lab Conveyor Magazine Front software interface. The top left corner features the FESTO logo and the text 'CP Lab Conveyor Magazine Front'. The main title 'System - Version' is centered at the top. On the right side, the status bar shows 'Automatic mode' with the date '22/02/2021', 'MES Mode' with a green indicator light, and the time '09:31:32'. Below the title bar, there are four main navigation buttons: 'Home' (house icon), 'Setup mode' (hand icon), 'Parameters' (grid icon), and 'System' (gear icon). The 'System' button is currently selected. On the left side, there is a vertical menu with seven options, each preceded by a blue arrow: 'Settings', 'Diagnostics', 'SW Versions' (highlighted in blue), 'Backup', 'Oper. hours', 'TimeZone PLC', and 'TimeZone HMI'. The main content area displays 'actual library version:' followed by a box containing 'V4.00'.

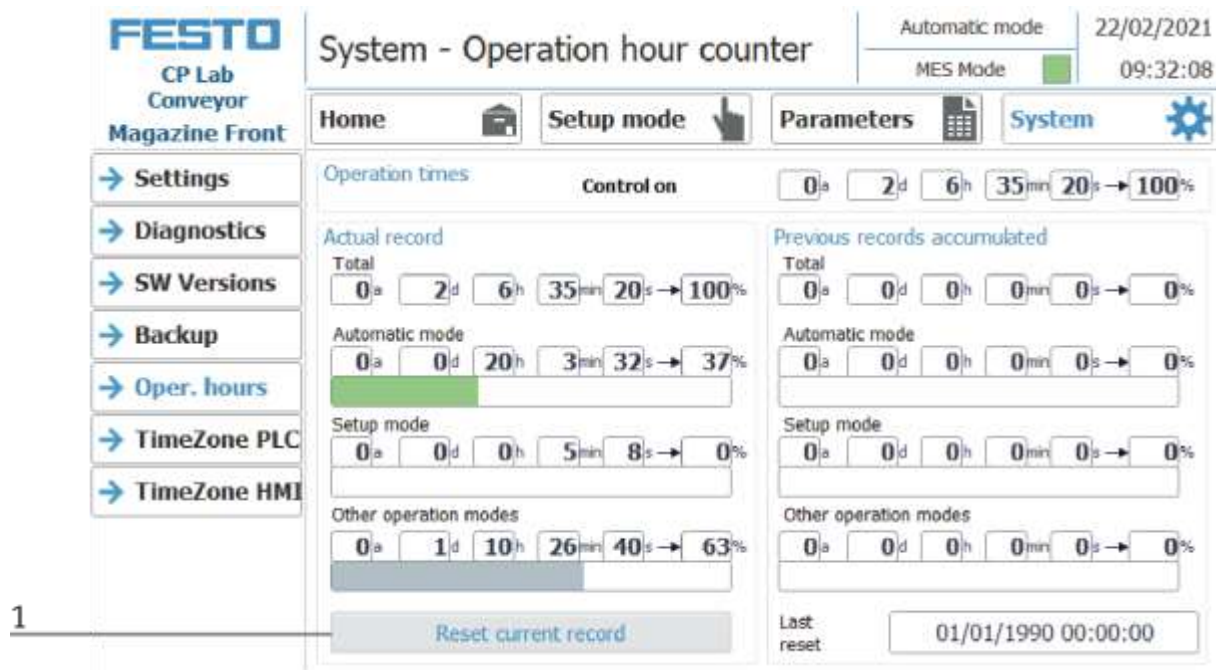
Display of the current library version.

Sub menu Backup



Position number	Description
1	<p>Save parameters button: all parameters are saved, for this it is necessary to press the button for at least 2 seconds.</p> <p>The display shows the date of the last storage.</p>
2	<p>Restore parameters button: all parameters are loaded, for this it is necessary to press the button for at least 2 seconds</p> <p>The display shows the date on which the parameters were last loaded.</p>

Submenu operating hours counter



Display of the operating times with allocation to the respective operating mode.

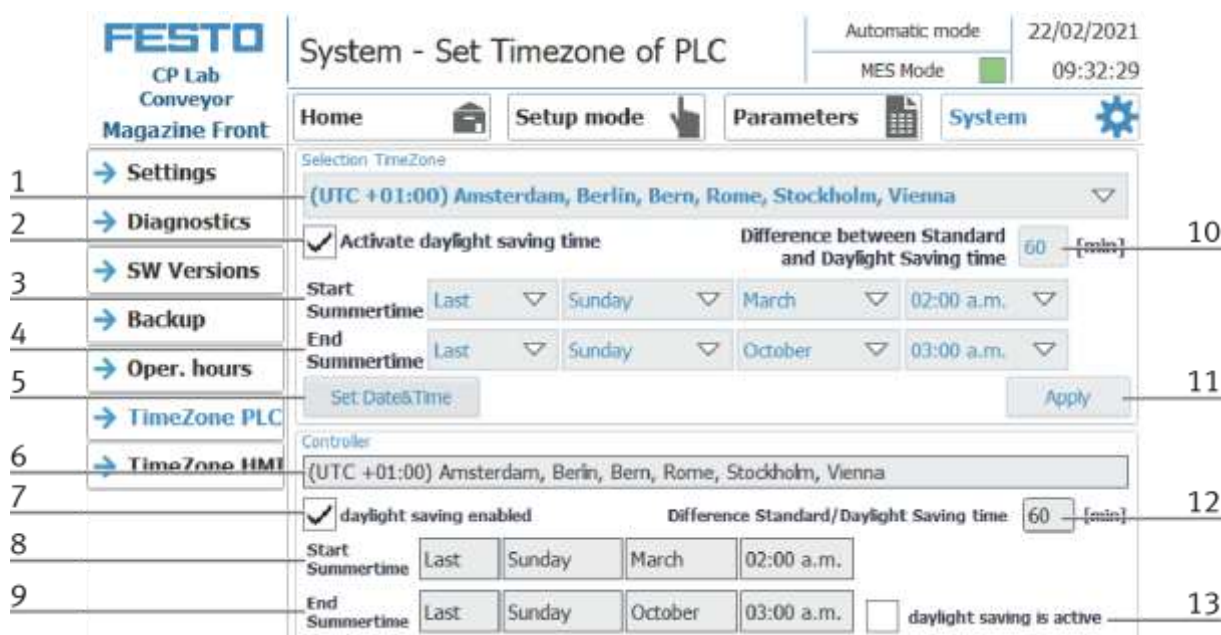
In the "Operation times" area, the time since the control was switched on is counted.

In the "Actual record" area, the time until the next time the "Reset current record" button is pressed is counted. The times are divided into the categories "Total", "Automatic mode", Setup mode and "Other operating modes". The times are counted under the heading "Other operating modes" while the station is in the operating mode "Automatic preselection", "Setup" and "No operating mode". The value in the "Total" line represents the total of the operating times differentiated according to the operating mode. The percentage refers to the proportion of the operating mode in the total time.

With the button (1) "Reset current record", the current recording is set to 0 and the operating times contained therein are added to the "Previous recordings accumulated" area. The current recording can thus be used, for example, for daily recordings.

All counter values are saved in a retentive data block. These are lost when the controller is booted. If they are to be retained, the values must be saved beforehand.

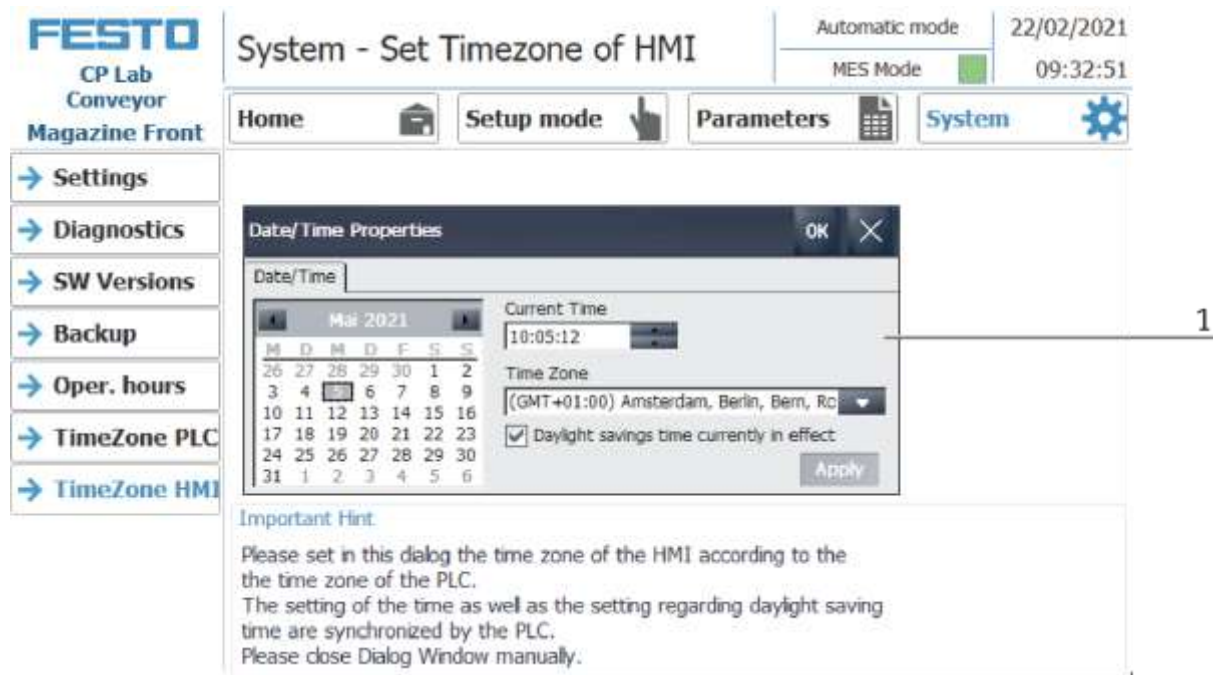
Time zone submenu in the PLC



The time and time zone of the PLC can be set in this menu. The default settings of the PLC are overwritten when you click the "Apply" button.

Position number	Description
1	Select TimeZone
2	Checkmark set - the daylight saving time changeover is automatically changed at the times "Beginning of daylight saving time" and "End of daylight saving time" Checkmark not set - there is no daylight saving time changeover
3	Setting the start of daylight saving time
4	Setting the end of summer time
5	Set time & date: When this button is pressed, a pop-up window opens for setting the time of the PLC
6	Display of the current time zone of the controller (Only valid if the time zone of the PLC has been set once using the "Apply" button)
7	Display of whether daylight saving time changeover is active in the PLC. (Only valid if the time zone of the PLC has been set once using the "Apply" button)
8	Display of the current start of daylight saving time in the control (Only valid if the time zone of the PLC has been set once using the "Apply" button)
9	Display of the current end of daylight saving time in the control (Only valid if the time zone of the PLC has been set once using the "Apply" button)
10	Enter the time difference between summer and winter time in minutes.
11	Accept the selected settings for the time zone and time change by pressing the button.
12	Display of the time difference between summer and winter time in minutes. (Only valid if the time zone of the PLC has been set once using the "Apply" button)
13	Display of whether daylight saving time is currently active. (Only valid if the time zone of the PLC has been set once using the "Apply" button)

Time zone submenu in the HMI



The time and time zone of the HMI can be set in this menu. The default settings of the HMI are overwritten. It is important to set the time zone in the HMI the same as it is set in the PLC, otherwise certain functions will get a different time stamp. (e.g. sending emails)

Position number	Description
1	<p>System pop-up window of the HMI for selecting the time zone. The selected time zone in the Time Zone drop-down field is transferred to the HMI by pressing the "Apply" button.</p> <p>Before exiting the menu item, close the system pop-up window by pressing the X at the top right.</p>

9.4 Switching on the station





Illustration similar

1. The station is supplied with voltage.
2. The station is supplied with 6 bar air pressure.
3. All EMERGENCY STOP signal transmitters (pushbuttons, door contacts, light barriers, etc.) are not actuated and unlocked.
4. Turn on the main switch – power supply unit.
5. Press the RESET button, the RESET button lights up blue, the HMI starts and starts up.
6. Wait till HMI is ready

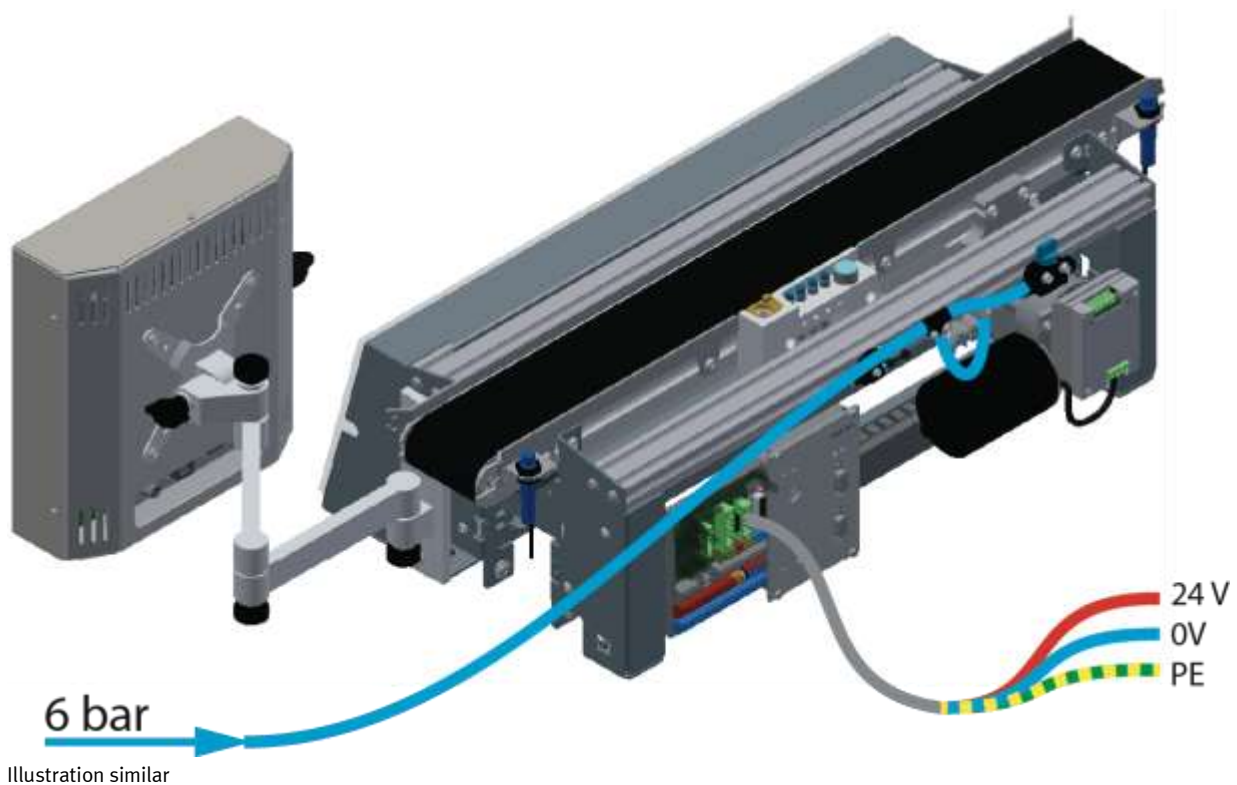
9.4.1 Start automatic

The emergency stop is released in the same way at all other stations of the CP Factory system.

	 WARNING
	<ul style="list-style-type: none"> • Danger of being pulled in at the conveyors <ul style="list-style-type: none"> – When the automatic mode starts, the belts of the conveyor belts start to move, creating a risk of being pulled in. – When starting, do not stand directly at the ends of the belt or hold on to them, keep enough distance. – Failure to heed the information given can lead to injuries.

For the CP Lab conveyor, an initial start-up has been made ex works.

Please follow the following instructions in order to be able to work with CP Lab conveyor as well as with a possibly present application:



1. CP-L-CONV with 24 V DC motor: Connect the power supply 230 V AC for the power supply unit and connect the 24 V supply cable of the module.
 CP-L-CONV with 230 V AC motor and G120 Edutainer: Connect the the supply unit Edutainer with 230 V. Connect the 24 V supply calbe of the module and connect the the supply cable of the G120.
 CP-L-CONV with 400 V AC motor and G120 Edutainer: Connect the the supply unit Edutainer with 400 V. Connect the 24 V supply calbe of the module and connect the the supply cable of the G120.

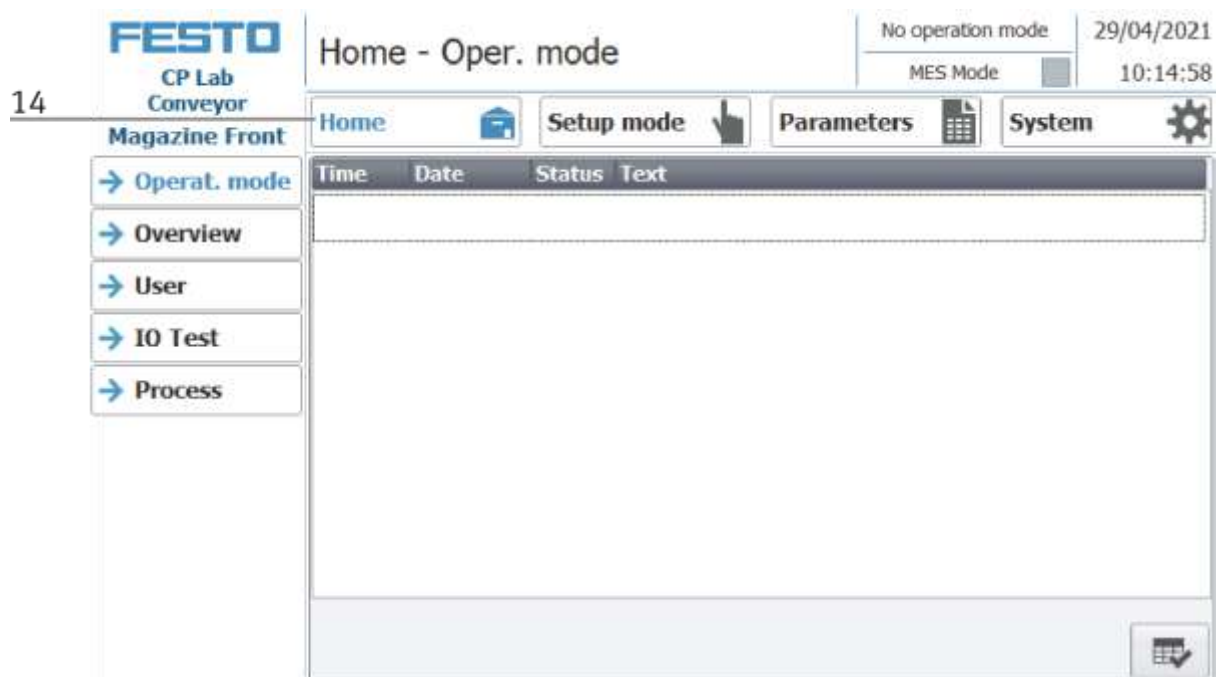
2. The power supply is correctly connected to the CP Lab conveyor, but not yet switched on yet.
3. The CP Lab conveyor is supplied with approx. 6 bar compressed air. When commissioning for the first time, make sure to increase the pressure slowly. This prevents unpredictable events.
4. All EMERGENCY STOP signaling devices (pushbutton, door contact, light barriers, etc.) are not actuated or activated and unlocked.
5. Check any installed application for visual damage and repair if necessary
6. Remove workpieces
7. For CP-L-CONV with 24 V DC motor: Switch on the power supply to the power supply unit.
For CP-L-CONV with 230 V AC motor and G120 Edutainer: Switch on the Edutainer and G120 supply unit.
For CP-L-CONV with 400 V AC motor and G120 Edutainer: Switch on the Edutainer and G120 supply unit.
8. The HMI (touch panel) is started and starts up
9. Illuminated button Q1 on the control panel flashes
10. Press illuminated button Q1
11. Q1 illuminated pushbutton lights up.
12. Acknowledge errors on the HMI by clicking on the error message.



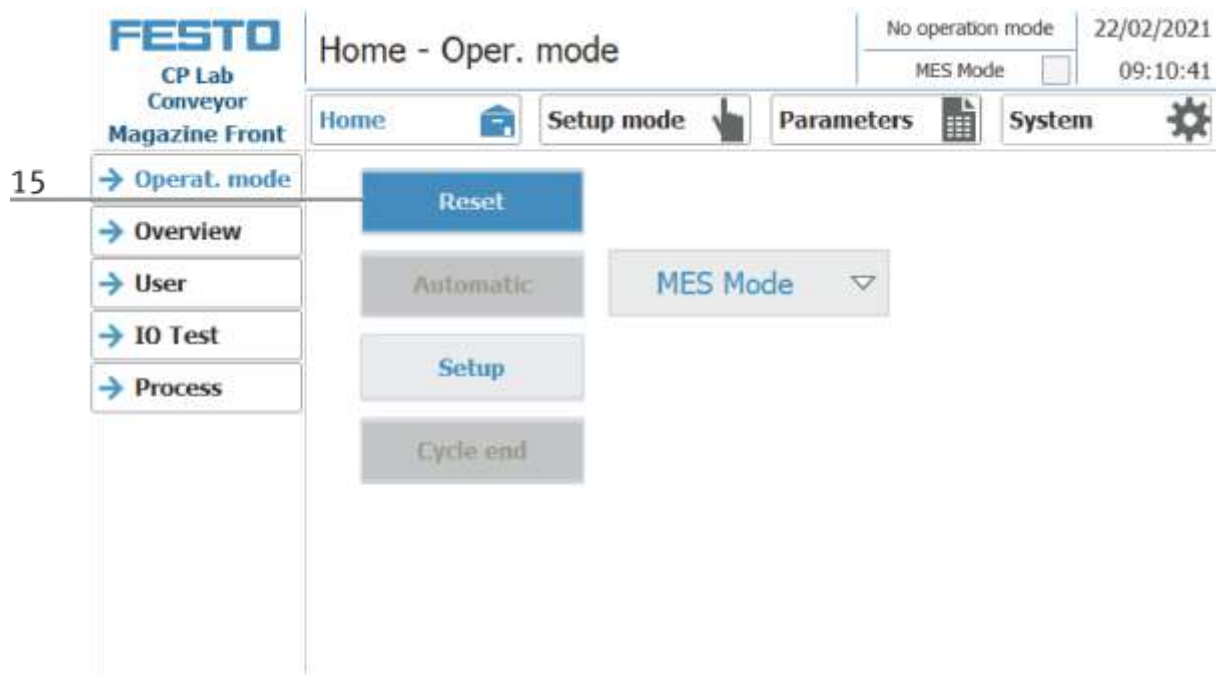
13. The error message is displayed in the main window. After the error situation has been remedied, it can be acknowledged by pressing the RESET button.



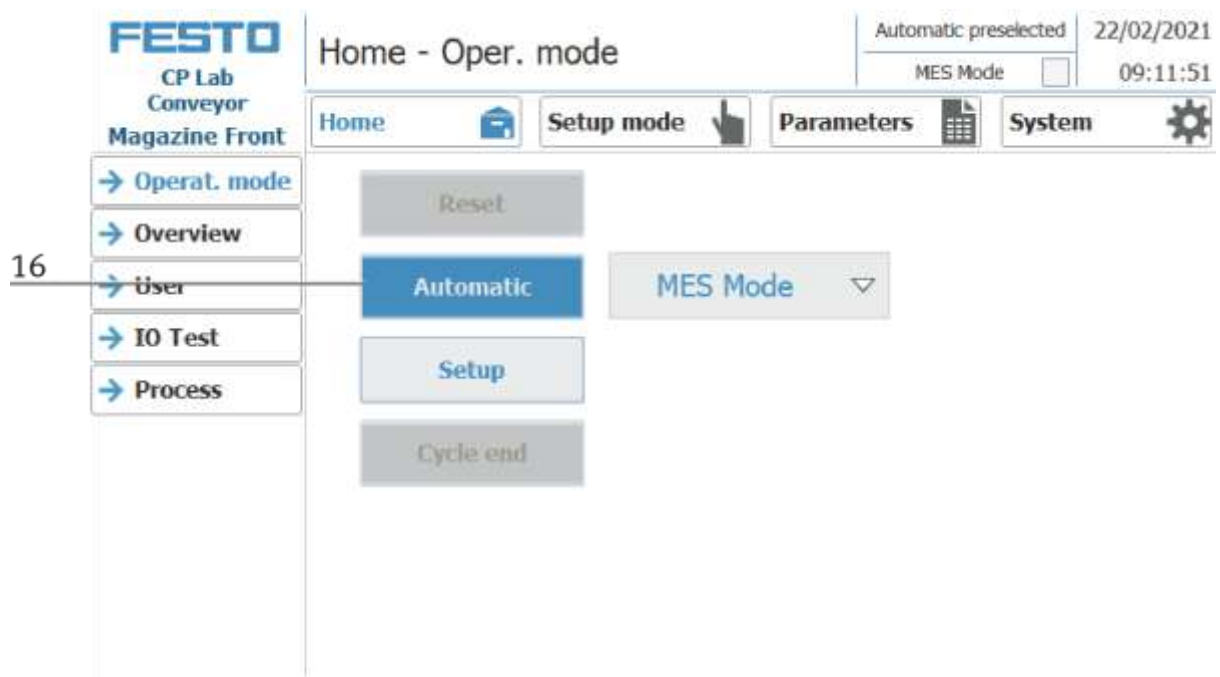
14. Press Home Button



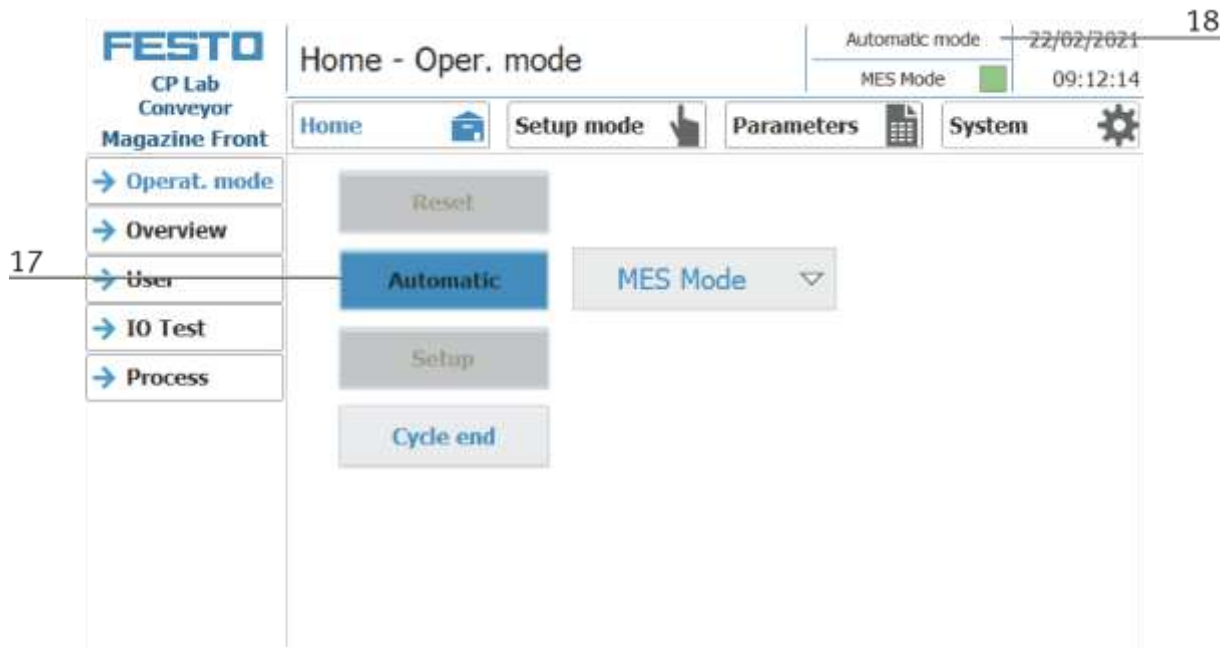
15. Press the flashing RESET Button. Station/application moves in home position.



16. Press the flashing AUTOMATIC Button



17. AUTOMATIC Button lights up
18. Automatic mode is active



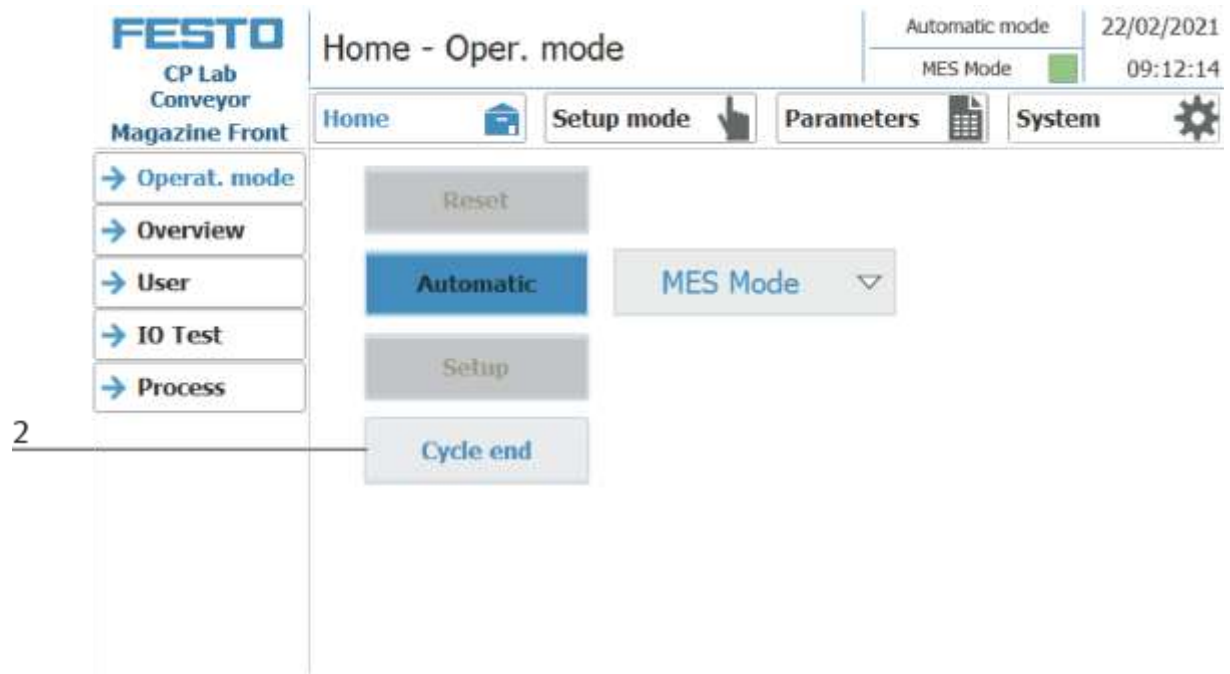
9.4.2 Sequence Description Automatic

If the automatic sequence was started,

1. The automatic button lights up blue
2. Stoppers are retracted
3. The workpiece is transported in circulation mode
4. If a carrier moves into the module / application module, this will execute your automatic process. The operation of the module / application module is, however, only started if the operation in MES is intended for this resource and the resource can also carry out this operation.
5. The busy displays become active.
6. During this time, the automatic sequence is executed in the application.
7. The next resource and operation are written to the RFID chip
8. When the module / application module is ready, the display changes back to the original state and the stopper is retracted
9. The carrier moves out of the working position and is available to further modules / application modules.

9.4.3 Process description Cycle End

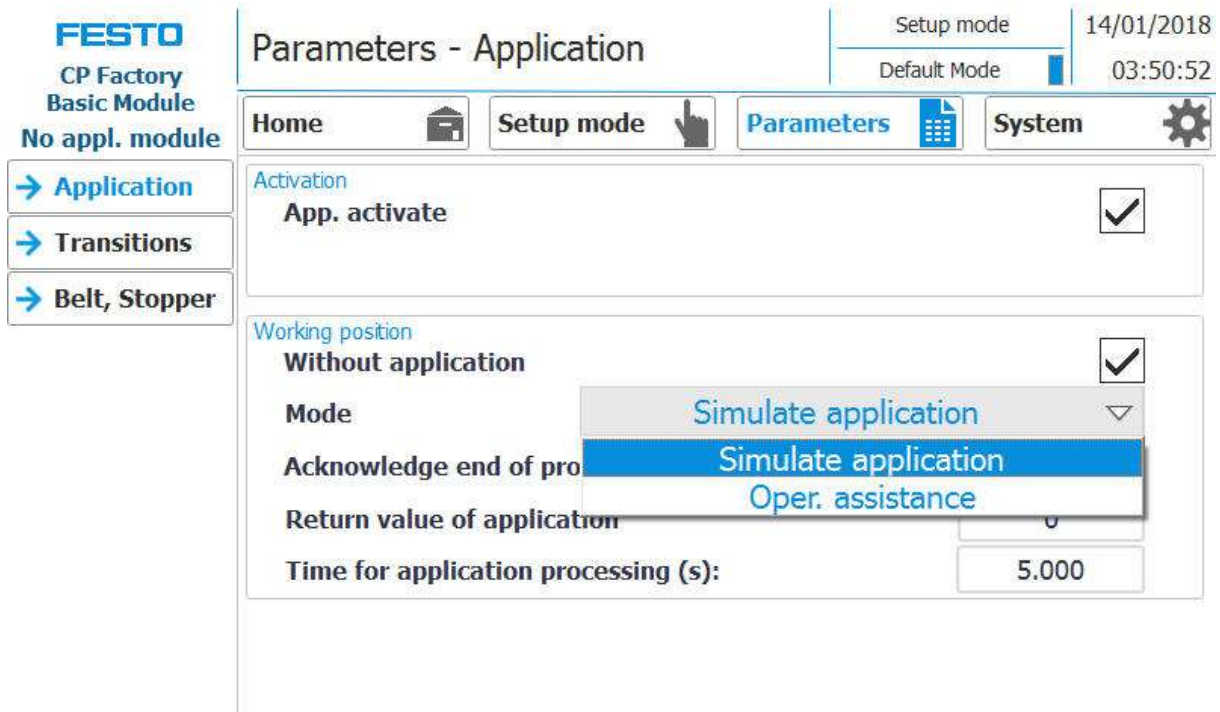
1. An automatic cycle is active.
2. Press the button Cycle End.



3. The module/application module will execute the run until cycle end. During this time, the button Cycle End has got a red background.
4. The stoppers are extended.
5. The conveyors are stopped.

9.5 Operator assistance and simulate application on free AP

The following chapter is valid for all basic modules (Bypass, Linear, branch). It is explained by way of example on the basic module Linear.



Selection of the mode via the touch panel

Each free application position, which is not equipped with an application module, can provide a simple operator assistance and a simulate application.

Thus every free AP provides the following functions in default mode as well as in MES mode:

1. Generic sequence simulation
2. Operator assistance

The application function is added with a fitted application module

1. Process simulation of the application
2. Operator assistance
3. Application Function

9.5.1 Generic sequence simulation

FESTO
 CP Factory
 Basic Module
 No appl. module

Parameters - Application

Automatic mode 04/02/2018
 Default Mode █ 03:21:48

Home
 Setup mode
Parameters
 System

Activation

App. activate
☒

Working position

Without application
☒

Mode

Simulate application

▼

Acknowledge end of process
☐

Return value of application

0

Time for application processing (s):

10.000

1. If the mode is simulate application and a carrier moves into the application, it is stopped. The application procedure is simulated, this is indicated by the following screen.

Simulation of application

The application is simulated!

Processing time nominal	10.000
Processing time actual	3.719
Return value	+0

Progress

2. The processing time in this case is 10 sec. This can be set in the parameters. The current time is indicated by the bar in progress. At the end of the simulation, the return value is transferred to MES.
3. The carrier is released from the application position.

9.5.2 Operator assistance with display of pictures

FESTO
 CP Factory
 Basic Module
 Oper. assistance

Parameters - Application

Automatic mode 02/02/2018
 Default Mode █ 03:23:01

Home
Setup mode
Parameters
System

→ Application
 → Transitions
 → Belt, Stopper

Activation
 App. activate ☒
 Application mode Standard

Working position
 Without application ☒
 Mode Oper. assistance

Attention! If simulation is done as handwork, the parameters in the transition table have other meanings!

1. If the mode is set to operator assistance (application mode must be set to Standard) and a carrier moves into the application, it will be stopped.
2. The worker now has to complete the specified work task. This is specified in the transition table and consists of the element (parameter 1) and the action (parameter 2).

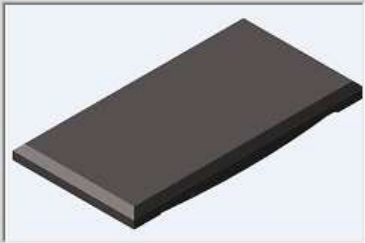
Parameter 1 / Element		Parameter 2 / Aktion	
0	No element	0	No action
1	Front cover	1	Check
2	Back cover	2	Extract
3	Printed circuit board	3	Assemble
4	Front fuse (in direction of transport)	4	Insert
5	Rear fuse (in direction of transport)	5	Apply
6	Both fuses	6	Rework
7	Workpiece	7	Reserve_7
8	Reserve_8	8	Reserve_8
9	Reserve_9	9	Reserve_9
10	Reserve_10	10	Reserve_10

Operator assistance

Handwork place:

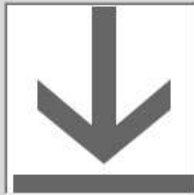
Parameter 1 : Element

Back cover



Parameter 2 : Action

Insert



Time required: **2.569**

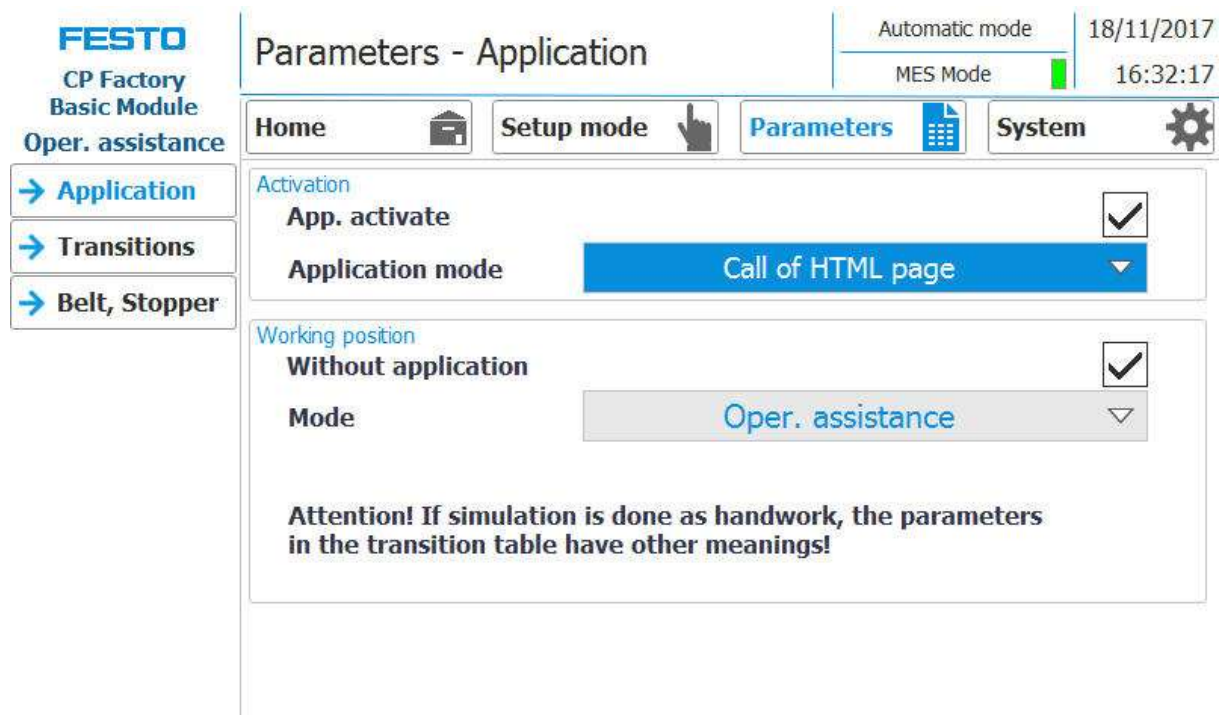
Order / operation step:

Refuse

Confirm

3. In this case, element 2 and action 4 are specified in the transitions. The worker must insert a backcover.
4. If the worker has completed the task, he must press the Confirm button to complete the task. The data is transmitted to MES
5. The carrier is released from the application position.

9.5.3 Operator assistance with call of htm-page



1. If the mode of the application is set to "operator assistance" (application mode must be set to call of HTML page / only possible in MES mode) and a carrier moves into the application, it will be stopped.
2. The worker now has to complete the specified work task. This is described on a html page, which must be created by the customer. The URL of this page, which must be present on the MES PC, can be specified in the work plan of the MES. This worker guide (depending on the html page content) is started if the OpNo 510 is selected for the AP in the work plan and the URL points to this URL link in the work step



3. In this case, the html page was designed so that a work instruction for mounting the front fuse appears in the worker's guidance.
4. If the worker has completed the task, he must press the Confirm button to complete the task. The data is transmitted to MES
5. The carrier is released from the working position.

9.6 HMI extension with G120 frequency converter

The extension with one frequency converter requires a different motor, the DC motor is replaced by a controllable AC motor. The control is taken over by a frequency converter. Here comes a G120 used. The frequency converter can be controlled manually in set-up mode. The control signals are automatically set in automatic mode. The state of previously set signals in the setup is overwritten.

It is possible to specify a speed setpoint for the belt.

1. To do this, switch to setup mode
2. Select the G120
3. The outputs can be switched in this field (control word 1) (explanation below)
4. The override can be set in this field (explanation below)
5. The inputs / signals are displayed in this field (status word 1) (explanation below)

FESTO CP Factory Basic Module

Setup - G120 Controller

Setup mode 12/02/2019
Default Mode 18:15:33

Home Setup mode Parameters System

No appl. module

→ Application

→ Belt

→ Stopper

→ G120

STW1

ON	Setpoint enable
No OFF2	Acknowledge faults
No OFF3	Control via PLC
Enable operation	Dir. of rot. reversal
Ramp-function generator enable	MOP, setpoint raise
Cont. ramp-function generator	MOP, setpoint lower

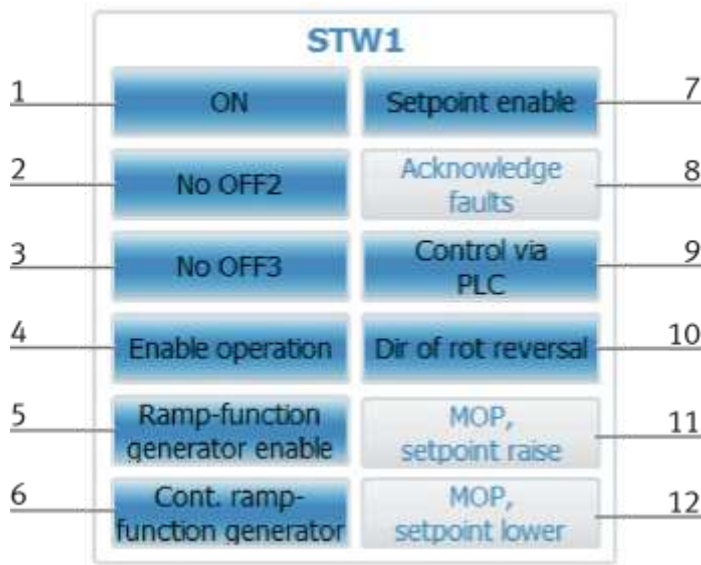
ZSW1

Ready for switching on	Act. value deviation within tolerance
Ready for operation	Control requested
Operation enabled	n comparison value reached
Fault present	I, M, or P limit not reached
OFF2 inactive	holding brake open
OFF3 inactive	No motor overtemperature
Switching on inhibited active	Motor rotates forwards
Alarm present	No thermal overload

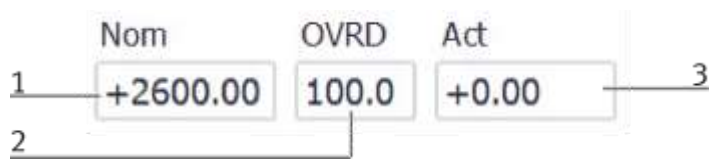
Nom OVRD Act

+2600.00 100.0 +0.00

If the outputs are set, they are highlighted in blue. See training manual G120 page 124.



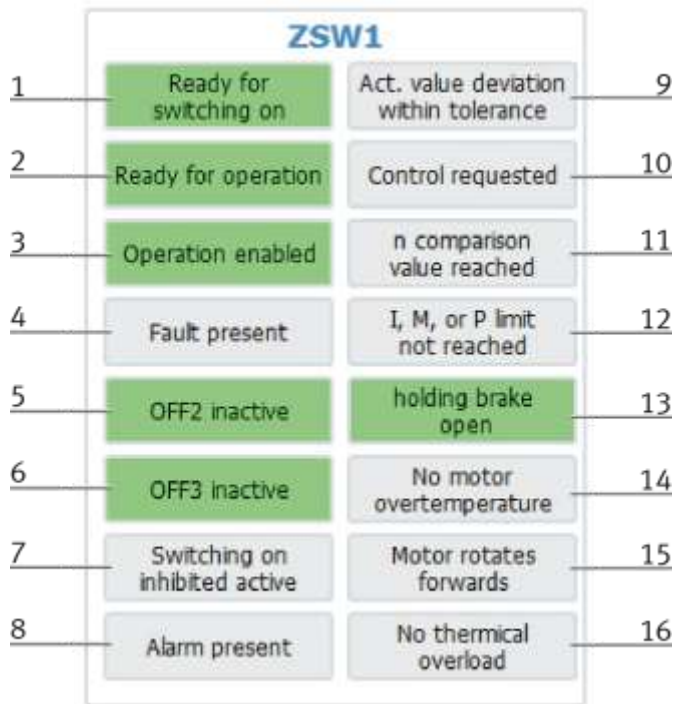
Position	Description
1	ON - Set the inverter to the "Ready to run" state, the direction of rotation must be set via Bit11.
2	No OFF2 - Coast to a standstill, immediate pulse inhibit, drive spins to a stop.
3	No OFF3 - Quick stop, fast stop: Shut down with the fastest possible deceleration rate.
4	Enable operation Control and inverter pulses are enabled.
5	Ramp-function generator enable
6	Enable HLG - enable ramp function generator
7	Enable setpoint - the value selected at the HLG input is enabled.
8	Acknowledge fault - A fault is acknowledged with a positive edge, and the inverter then switches to the "start-up inhibit" state.
9	Guidance by PLC - Control via interface, process data valid
10	Direction reversal - motor will run counterclockwise in response to a positive setpoint.
11	MOP higher - set the motor potentiometer higher
12	MOP lower - Lower the motor potentiometer



The setpoint can only be changed in set mode. However, this setpoint is also adopted for automatic mode. It is thus possible to adapt the conveyor belt speed to the respective conditions.

Position	Description
1	Setpoint value - entry of the setpoint value by clicking in the field - an input mask appears and the desired setpoint can be entered. Only changeable in setup mode [rpm]
2	Display of override - Change between 50/100 depending on the area code in the conveyor belt setup
3	Actual value - display of the current override

Display of inverter status, active displays are highlighted in green.
See training manual G120 - page 125.



Position	Description
1	Ready for switching on - power supply is switched on, electronics are initialized, pulses are blocked.
2	Ready for operation - Inverter is switched on (ON command is pending), no fault is active, inverter can start as soon as the command "Enable operation" is given. See control word 1, bit =
3	Operation enabled - drive follows setpoint. See control word 1, bit 3.
4	Fault present - drive faulty. There is a fault in the drive, which means that it is not in operation and switches to the "startup inhibit" state after successful rectification and acknowledgment of the fault.
5	OFF2 inactive - "coast to standstill" command is pending.
6	OFF3 inactive - Quick stop command is active.
7	Switch-on disable active - The drive is only switched back to the "switched on" state if the commands "no coast down" AND "no quick stop" - followed by "ON" - are given.
8	Alarm present - drive still in operation; Warning in service / maintenance parameter; no acknowledgment; see alarm parameter r2110.
9	Act. value deviation within tolerance - setpoint-actual value deviation within the tolerance range.
10	Control requested - The automation system is requested to take over control.
11	N comparison value reached
12	I, M, or P-limit not reached
13	Holding brake open - signal can be used to control a holding brake
14	No motor overtemperature
15	Motor rotates forwards
16	No thermal overload

10 Components

10.1 Touch panel CP-L-HMI-T7 (option)

You control the system with the touch panel. The upper control row is optionally available.

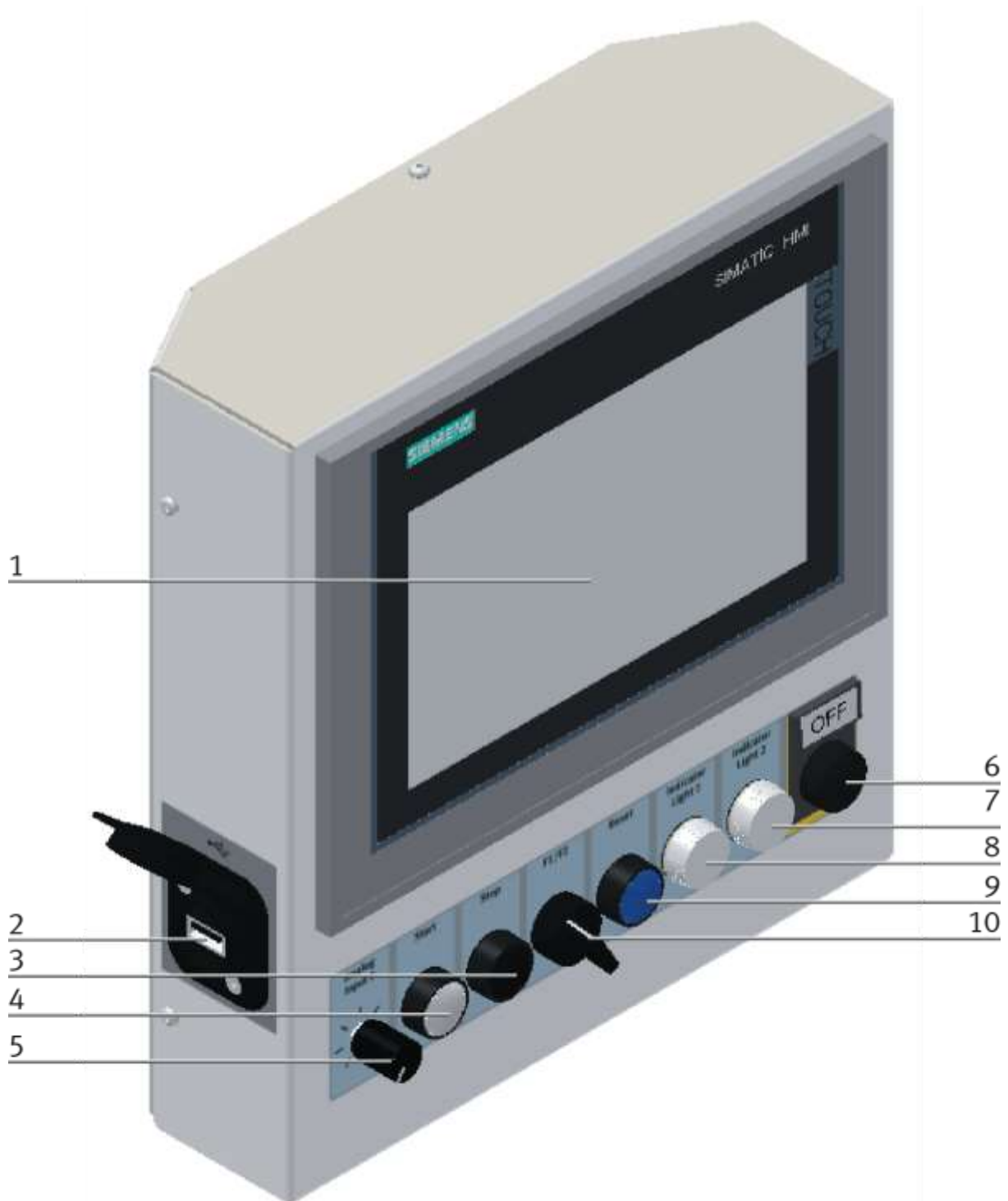


Illustration similar

Position	Description	X2 Sub D 15 pole/ input	X2 Sub D 15pole /output
1	Touch screen		
2	USB socket X6		
3	STOP button black /button SF2	SF2 / X2: 3 / I1	
4	START illuminated push-button white/ button SF1/ light PF1	SF1 / X2: 1 / I0	PF1 / X2: 2 / Q0
5	Potentiometer RA 1		
6	OFF button SF5 – at M12 panel plug		
7	Q2 indicator light white / light PF4		PF4 / X2: 8 / Q3
8	Q1 indicator light white / light PF3		PF3 / X2: 6 / Q2
9	RESET illuminated push-button blue / button SF4 / light PF2	SF4 / X2: 7 / I3	PF2 / X2: 4 / Q1
10	Selector switch 00 Auto/F1/SF3	SF3 / X2:5 / I2	

10.1.1 Front PCB XZ1

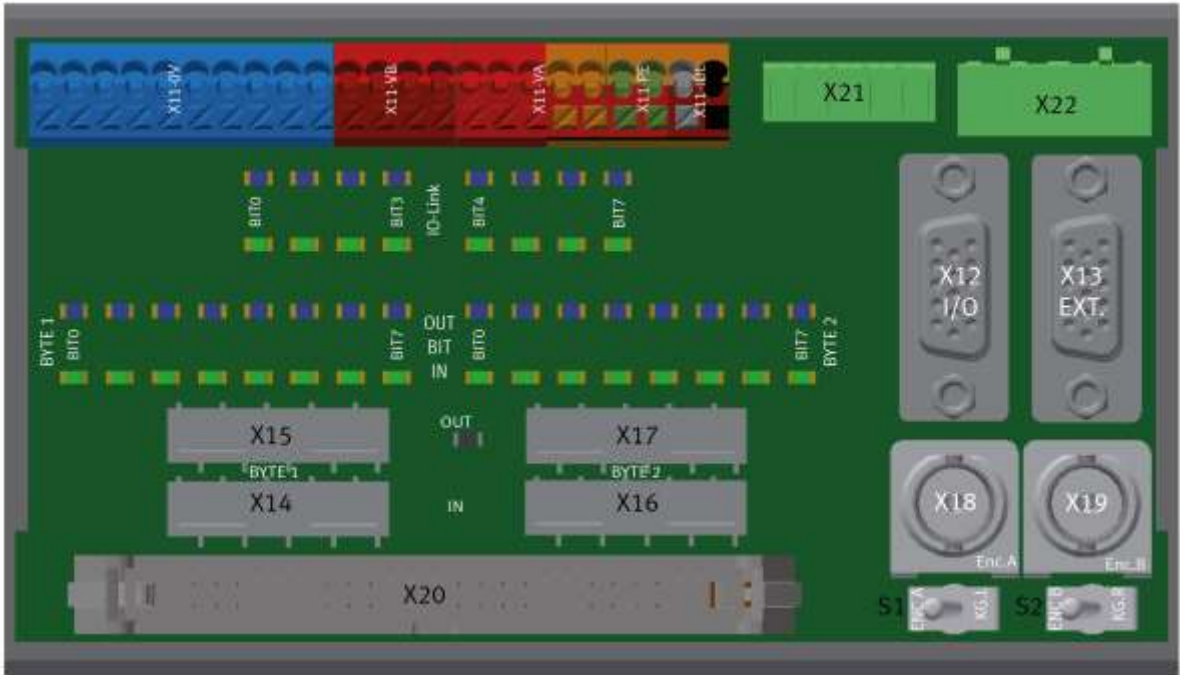


Illustration similar

XZ1 PCB operation panel connection

Function	XZ1
Start Button / SF1	X12:1
Stop button / SF2	X12:3
Switch operation panel / SF3	X12:5
Reset button / SF4	X12:7
Start lamp / PF1	X12:2
Reset lampn / PF2	X12:4
Lamp Q1 / PF3	X12:6
Lamp Q2 / PF4	X12:8

- XZ1-X17 = Output-Byte 2
- XZ1-X16 = Input-Byte 2
- XZ1-X15 = Output-Byte 1
- XZ1-X14 = Input-Byte 1 1
- XZ1-X12 = controlpanel basic functions
- XZ1-X13 = controlpanel additional buttons
- XZ1-X18 = incremental encoder BNC-Connector 1
- XZ1-X19 = incremental encoder BNC-Connector 2
- XZ1-X11 = terminals PCB front side
- XZ1-X20 = connection to opposite PCB
- XZ1-X1 = connection to opposite PCB
- XZ1-X21 = Powersupply HMI and external OFF Button
- XZ1-X22 = 24VA and 24VB for external interconnection

10.1.2 Back PCB XZ2

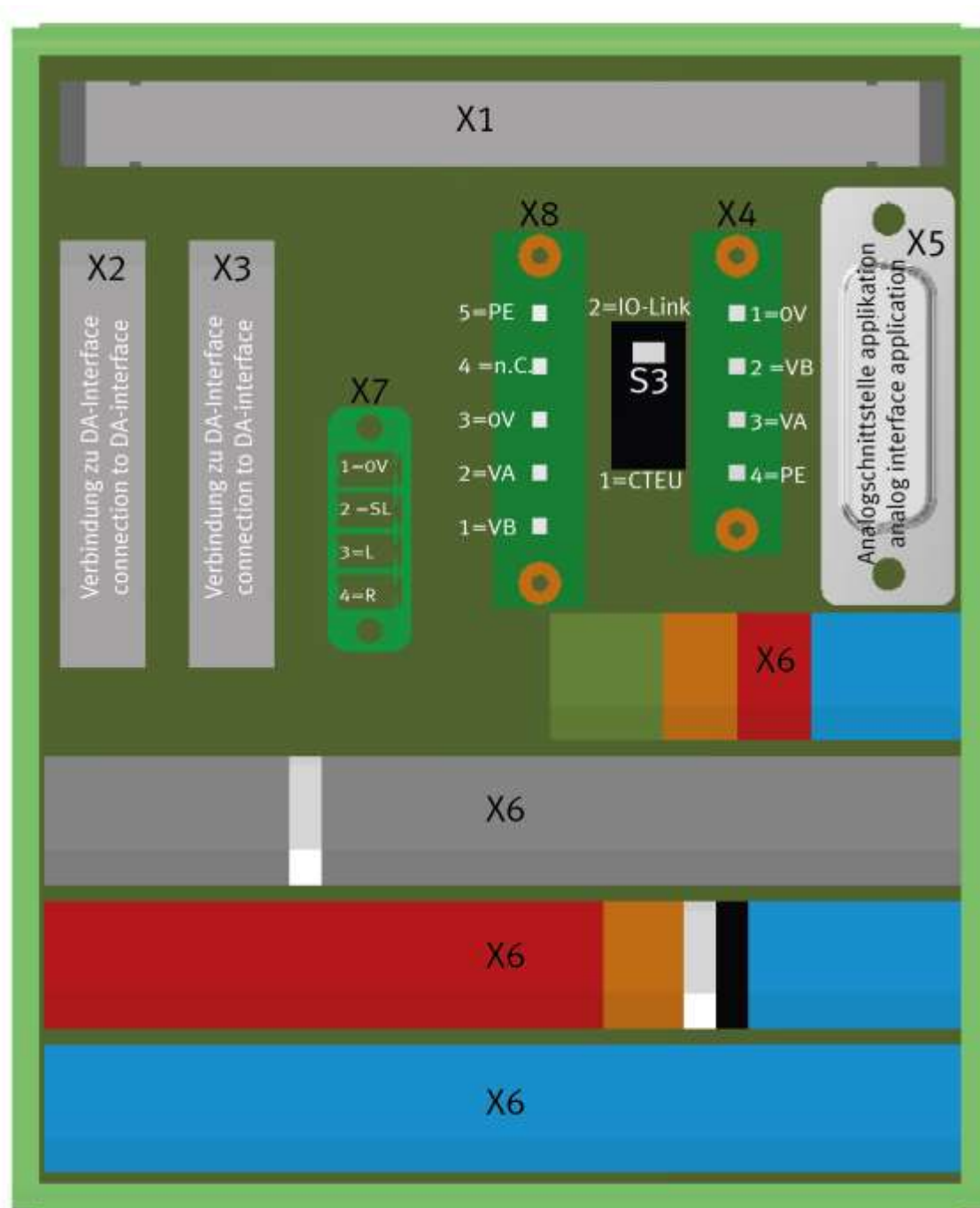


Illustration similar

- XZ2-X4 = power supply
- XZ2-X2 = connection 1 to DA-Interface
- XZ2-X3 = connection 2 to DA-Interface
- XZ2-X5 = analog signals for application
- XZ2-X6 = terminals PCB rear side
- XZ2-X7 = connection to external Motorcontroller
- XZ2-X8 = 24V application modules

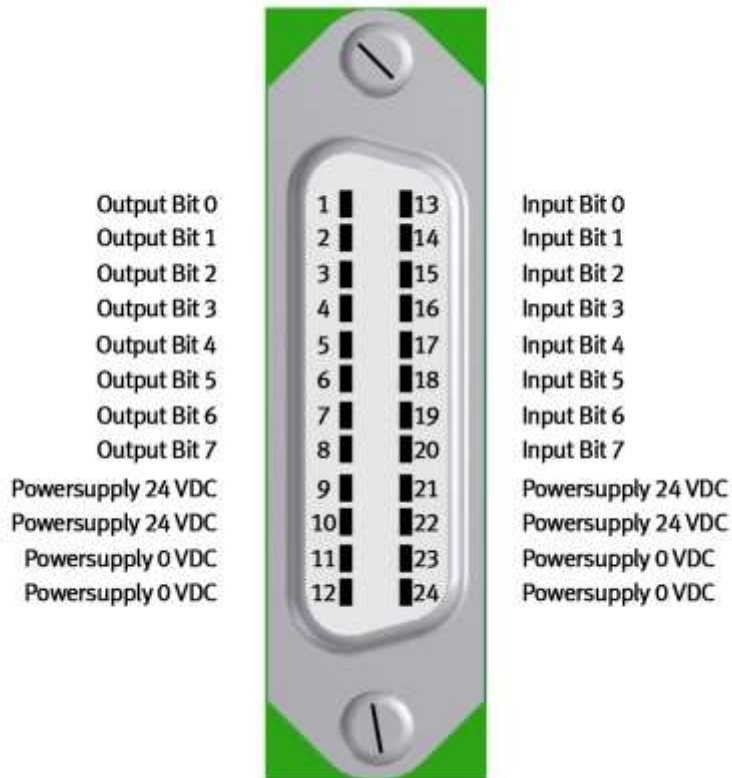
XZ2 Connections to PLC

Function	Controller	XZ2 in	XZ2 out	Sensor / Actor
Identcode Bit 0	KF21:I18.0 / XZ3:A1	X2:1	X6:1	BG1 / Identcode Bit 0
Identcode Bit 1	KF21:I18.1 / XZ3:A3	X2:3	X6:2	BG2 / Identcode Bit 1
Identcode Bit 2	KF21:I18.2 / XZ3:A5	X2:5	X6:3	BG3 / Identcode Bit 2
Identcode Bit 3	KF21:I18.3 / XZ3:A7	X2:7	X6:4	BG4 / Identcode Bit 3
Reserve	KF21:Q18.0 / XZ3:A1	X2:2	X6:19	
Reserve	KF21:Q18.1 / XZ3:A3	X2:4	X6:20	
Reserve	KF21:Q18.2 / XZ3:A5	X2:6	X6:21	
Reserve	KF21:Q18.3 / XZ3:A7	X2:8	X6:22	

Function	Controller	XZ2 out	Sensor / Actor
Pallet at left end	KF3:I1.6 / XG3:7	X6:13	BG5
Pallet at right end	KF3:I1.7 / XG3:8	X6:14	BG6
Transport direction to right	KF5:Q1.4 / XG5:5	X6:27	QA1:RE motor controller
Transport direction to left	KF5:Q1.5 / XG5:6	X6:28	QA1:LI motor controller
Transport slow speed	KF5:Q1.6 / XG5:7	X6:29	QA1:SL motor controller
Open stopper	KF5:Q1.7 / XG5:8	X6:30	QM1-MB1

Function	Controller	XZ2 in	XZ2 out	Sensor / Actor
Coupling receiver right	KF21:I18.4 / XZ3:B1	X3:1	X6:5	KG1
Coupling receiver left	KF21:I18.5 / XZ3:B3	X3:3	X6:6	KG2
Stopper opened	KF21:I18.7 / XZ3:B7	X3:7	X6:8	BG9
Coupling sender left	KF21:Q18.4 / XZ3:B2	X3:2	X6:23	GF1
Coupling sender right	KF21:I18.5 / XZ3:B4	X3:3	X6:24	GF2

10.1.3 SYS link Cable - Interface



Syslink – allocation

SYSlink PIN	Bit	Name	Syslink PIN	Bit	Function
01	0	Output AX.0	13	0	Input EX.0
02	1	Output AX.1	14	1	Input EX.1
03	2	Output AX.2	15	2	Input EX.2
04	3	Output AX.3	16	3	Input EX.3
05	4	Output AX.4	17	4	Input EX.4
06	5	Output AX.5	18	5	Input EX.5
07	6	Output AX.6	19	6	Input EX.6
08	7	Output AX.7	20	7	Input EX.7
09	24V	Power supply	21	24V	Power supply
10	24V	Power supply	22	24V	Power supply
11	0V	Power supply	23	0V	Power supply
12	0V	Power supply	24	0V	Power supply

10.1.4 RFID Read/Write system

The RFID read-write head describes and/or reads the data from a RFID data storage medium which is located on the bottom of the carrier. Any information concerning the workpiece can be read or transmitted. The read-write head is directly connected to the I/O link of the ET200SP.



Read-write head RF210R IO-Link / illustration similar

There are 2 different read / write heads which are addressed differently in the software, this must be considered.

Reader RF210R, order number 6GT2821-1AC32 with interface IO-Link V1.0

Reader RF210R, order number 6GT2821-1BC32 with interface IO-Link V1.1

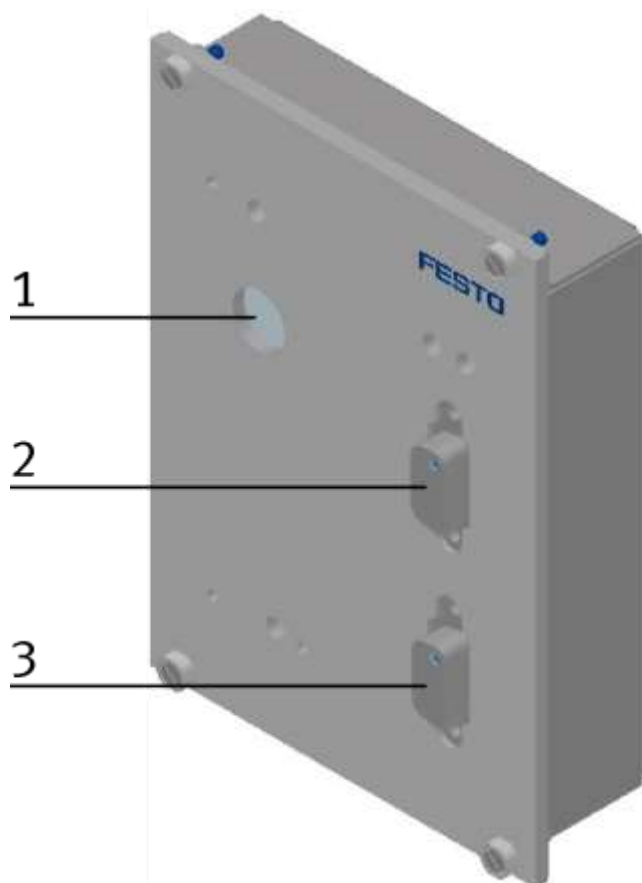


TW-R16-B128 RFID data storage medium / illustration similar

Clamp read-write head	Cable	I/O Link
TF1:1 / 24 V	XTF1:1 / BN	XG1/X12:1 - L+
TF1:3 / 0V	XTF1:3 / BU	XG1/X12:3 - L-
TF1:4 / Data	XTF1:4 / BK	XG1/X12:2 - C/Q

10.1.5 IO-Link DA-Interface (digital-analogue interface)

The I- port is an interface between the ET200SP and the sensors and actuators wired on the mini I/O terminals. The order number is 8038559.



I-Port KF11 / illustration similar

Position	Description
1	<p>I-Port –here the data are transmitted to the I/O link of the ET200SP. It is possible to remove the 5 pole cable and to replace it by an adapter plug. With the help of the CTEU bus knot it will be possible to adapt different bus systems to the system.</p> <p>The following bus systems are available presently: PN, PB, CC-Link, CAN, DeviceNet, Ether Cat</p> <p>The allocation of the 5 pole cable is as follows:</p> <p>Clamp 1 – 24 VB / cable has a brown stranded wire</p> <p>Clamp 2 – 24 A / cable has a white stranded wire</p> <p>Clamp 3 – OVB / cable has a blue stranded wire</p> <p>Clamp 4 – Data / cable has a black stranded wire</p> <p>Clamp 5 – OVA / cable has a grey stranded wire</p>
2	Data channel A
3	Data channel B



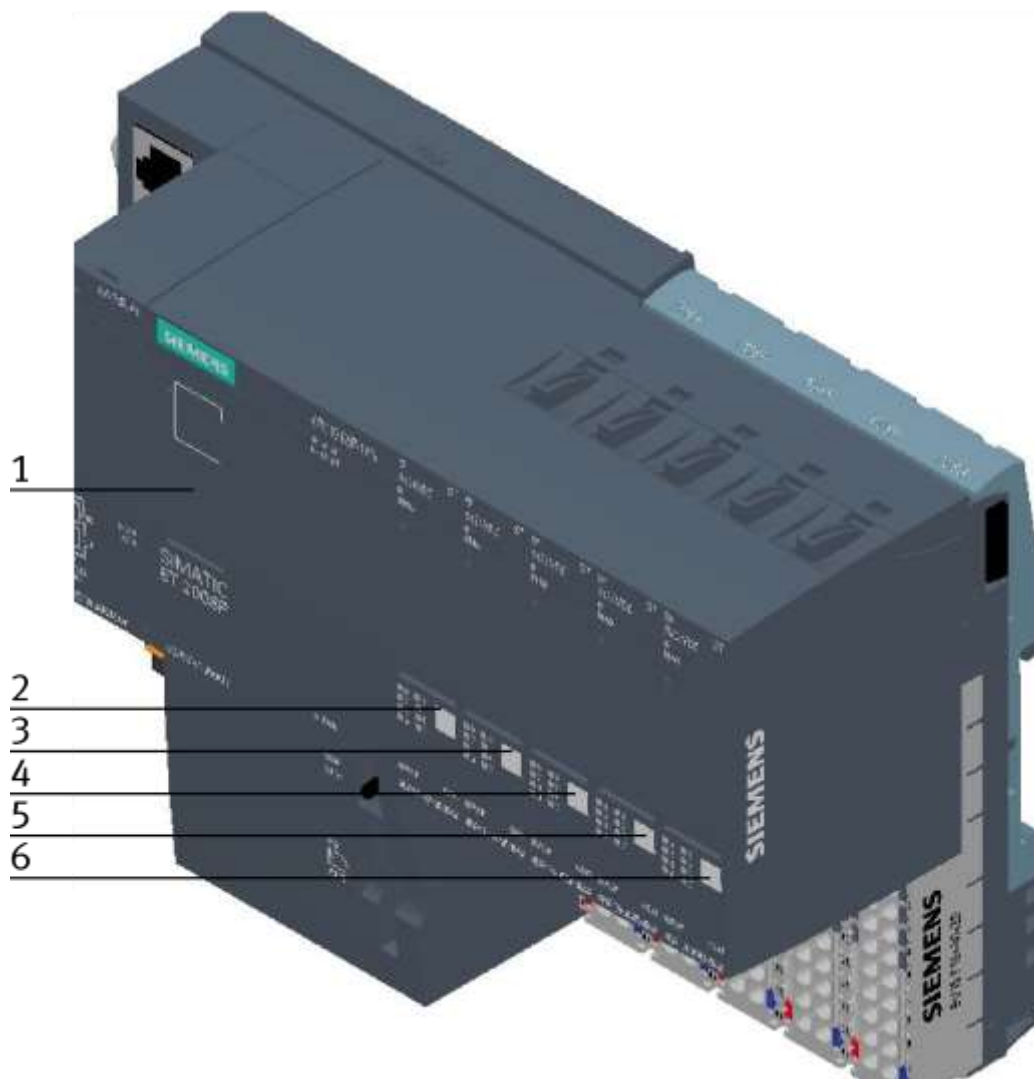
The SCALANCE X208 has eight RJ-45 jacks for the connection of end devices or other network segments.

10.2.1 Control systems

The control unit regulates all processes as well as the communication in the CP Lab conveyor. Different control systems can be used.

It is possible that a I/O Terminal is installed instead of an controller.

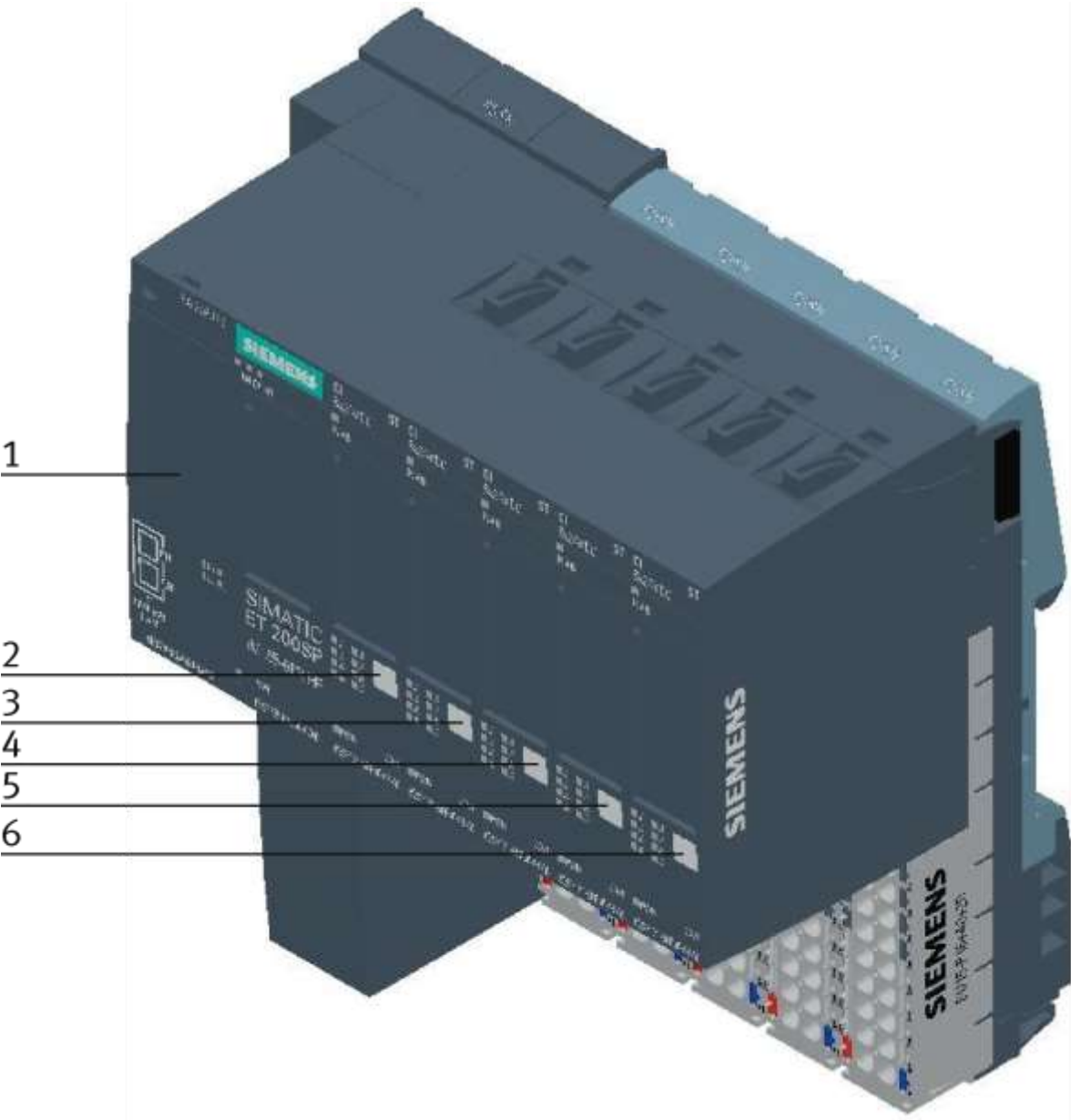
ET200SP with CPU1512



ET200 SP / illustration similar

Position	Description
1	ET200SP / CPU1512SP F-1PN / K1-KF1 / 6ES7512-1SK00-0AB0
2	DI / 8x 24VDC / K1-KF2 / 6ES7131-6BF00-0CA0
3	DI / 8x 24VDC / K1-KF3 / 6ES7131-6BF00-0CA0
4	DO / 8x 24VDC 0,5A / K1-KF4 / 6ES7132-6BF00-0CA0
5	DO / 8x 24VDC 0,5A / K1-KF5 / 6ES7132-6BF00-0CA0
6	CM / 4x IO-Link ST / K1-KF6 / 6ES7137-6BD00-0BA0

ET200SP with IM155



ET200 SP / illustration similar

Position	Description
1	ET200SP / IM155-6 PN HF / K1-KF1 / 6ES7155-6AU00-0CN0
2	DI / 8x 24VDC / K1-KF2 / 6ES7131-6BF00-0CA0
3	DI / 8x 24VDC / K1-KF3 / 6ES7131-6BF00-0CA0
4	DO / 8x 24VDC 0,5A / K1-KF4 / 6ES7132-6BF00-0CA0
5	DO / 8x 24VDC 0,5A / K1-KF5 / 6ES7132-6BF00-0CA0
6	CM / 4x IO-Link ST / K1-KF6 / 6ES7137-6BD00-0BA0

10.2.2 Signal Converter

The signal converter is a fibre optic unit with a teachable switching point.



Signal converter 552796 / SOE4-FO-L-HF2-1P-M8 / illustration similar

WARNING

Not to be used as a safety component! Electric voltage! Before you work on the electricity, you have to switch off the voltage.

Mounting and Setting

Connecting the plastic fibre optic cable

1. Open the clamp strap.
2. Insert the fibre optic cable to the stop into the holder (you have to overcome the resistance when inserting at the O ring)
3. Close clamp strap.

Setting sensitivity in a running process (turning conveyor motor)

1. Adjust the fibre optic cable to the object: \Rightarrow LED green is flashing, LED yellow is undefined.
2. Only the running process is in the optical path; press the button for approx. 3s until both LEDs are flashing simultaneously.
3. Press button again until there is at least one process cycle executed in the optical path.
 - a) green LED is flashing for a short time and starts lighting up, \Rightarrow sensitivity settings are saved, sensor is ready for operation.
 - b) both LEDs are flashing simultaneously \Rightarrow Sensor cannot detect the object, no sensitivity settings are saved.

Setting the start function (N.O. / N.C.)

1. Press button for approx. 13 s \Rightarrow LEDs are flashing alternately.
2. Release button: \Rightarrow green LED is flashing.
3. While the green LED is flashing, on every pressing of the button, the start function is inverted. The current function is indicated by the yellow LED.
4. Don't press the button for 10 s: \Rightarrow set function is saved, sensor is ready for operation.

Factory setting / maximum sensitivity (default)

1. No object in the sensing range. Press button for approx. 3 s until both LEDs are flashing simultaneously.
2. No object in the sensing range. Press button for approx. 1 s.
 - \Rightarrow Sensor is set at maximum sensitivity.
 - \Rightarrow Sensor has its factory setting again

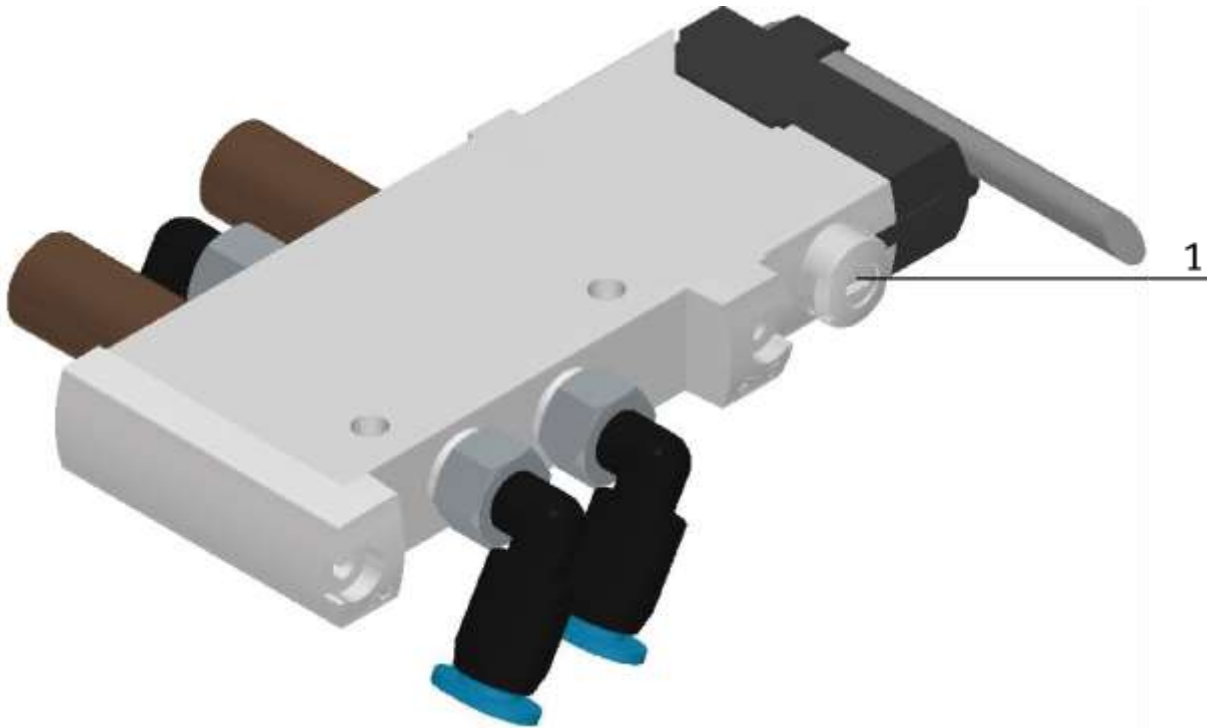
Pilot line (ET) / Process of external Teach-in

- 3 s at $+U_s$ / determine teach point 1
- open
- 3 s at $+U_s$ / determine teach point 2
- open setting saved, end of external Teach

10.2.3 Solenoid valve

The solenoid valve controls the cylinder of the stopper unit. The solenoid valve has got a manual override (see pos.1).

When you press it (non-locking), the cylinder drives the stopper unit down as long as you press it. When you press the manual override and turn it (locking), the cylinder drives down with long-lasting effect.



Solenoid valve 574351 / VUVG-L10-M52-MT-M5-1P3 / illustration similar

11 Extensions

11.1 Extension with an active corner

In order to make a circulation of several CP Lab conveyors, it is possible to assemble the CP Lab conveyors in the rectangle and to connect the conveyors with active corners. A motor drives the corner and the carrier is transported to the following CP Lab conveyor. The active corners are connected in parallel to the motor used, the corner is mounted on the left side of the CP Lab conveyor. The coupling sensors of the conveyors are simply forwarded to the following CP Lab conveyor using light guide bridges.



Example concatenation 4 CP Lab conveyors with active corners / illustration similar

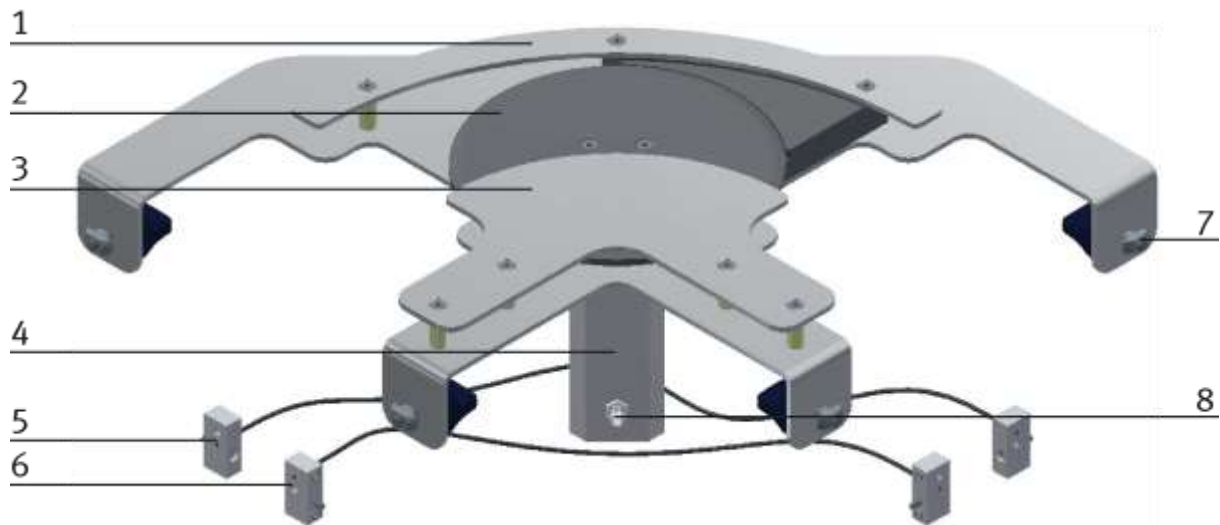


illustration similar

Position	Description
1	Outside guard railing
2	Turning table
3	Inside guard railing
4	Motor
5	Coupling sensor transmission
6	Coupling sensor transmission
7	Screw
8	Motor connection (see Circuit diagram p.13)

11.2 Extension with a passive corner

In order to achieve a circulation from several CP Lab conveyors, it is possible to assemble the CP Lab conveyor in the rectangle and to connect the conveyors with passive corners. The corners are equipped with balls which enable the carrier to be transported without drive to a further band mounted at a right angle. The coupling sensors of the conveyors are simply forwarded to the following CP Lab conveyor using light guide bridges.

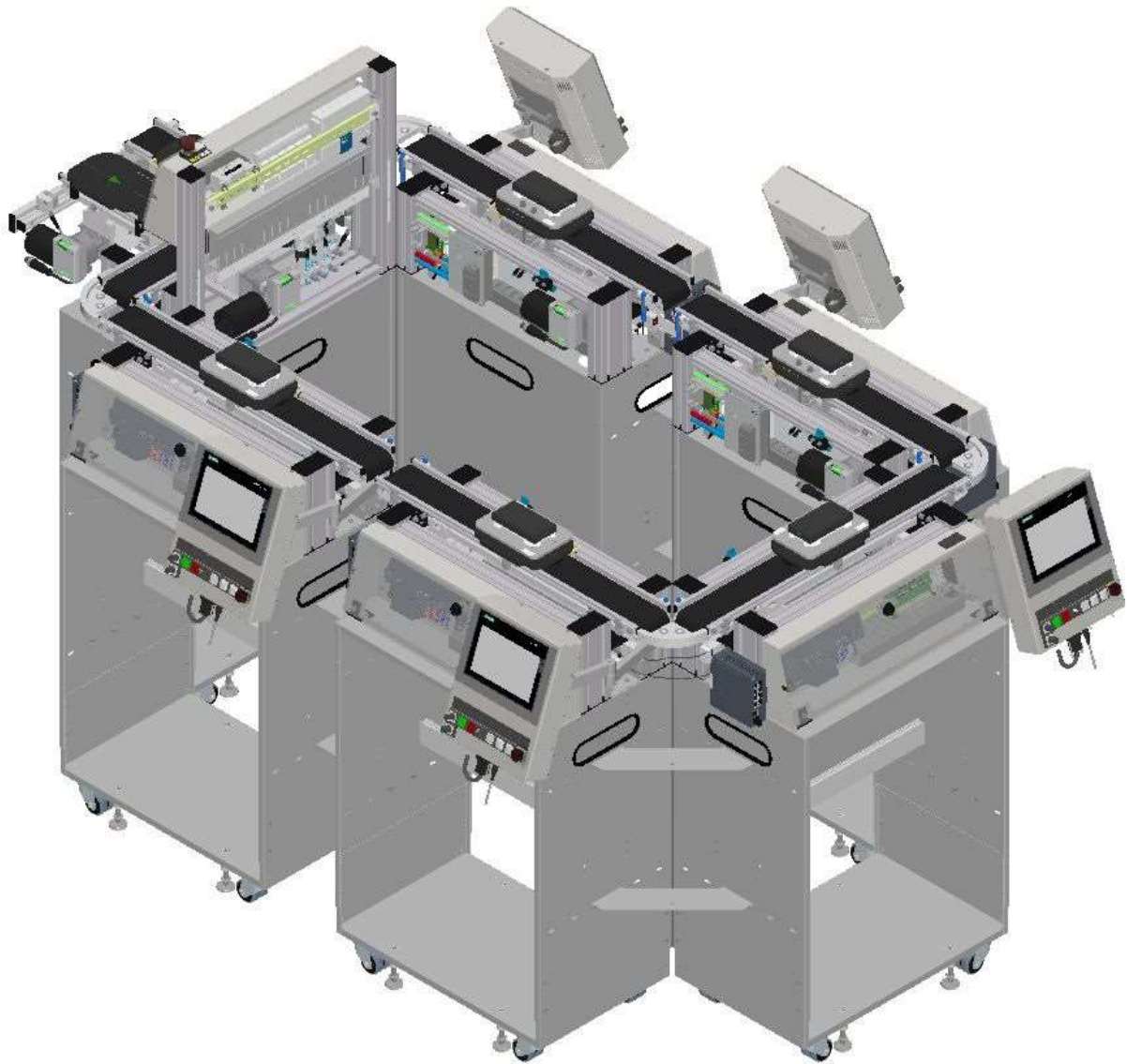


illustration similar

Example concatenation 6 CP Lab conveyors with passive corners

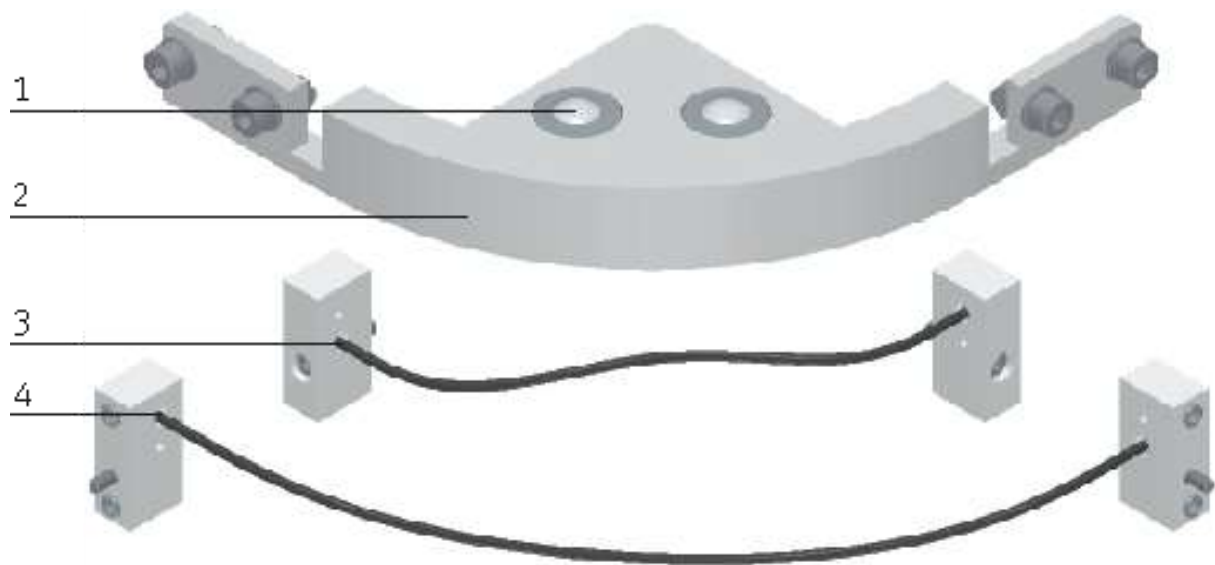


illustration similar

Position	Description
1	Ball caster
2	Passive guard railing
3	Coupling sensor transmission
4	Coupling sensor transmission

11.3 Robotino docking extension

To dock a robotino to a CP Lab conveyor, a small profile construction is necessary. The necessary sensors are already available on the conveyor. Although they are not disassembled, the inputs of the coupling sensors are now used for the coupling of the robotinos.



illustration similar

Position	Description
1	Coupling sensor robotino
2	Profile construction to dock a robotino on the left side
3	Coupling sensor robotino
4	Profile construction to dock a robotino on the right side



illustration similar

At positions 1 and 2 the deactivated sensors can be seen, they remain at the conveyor but are no longer connected.

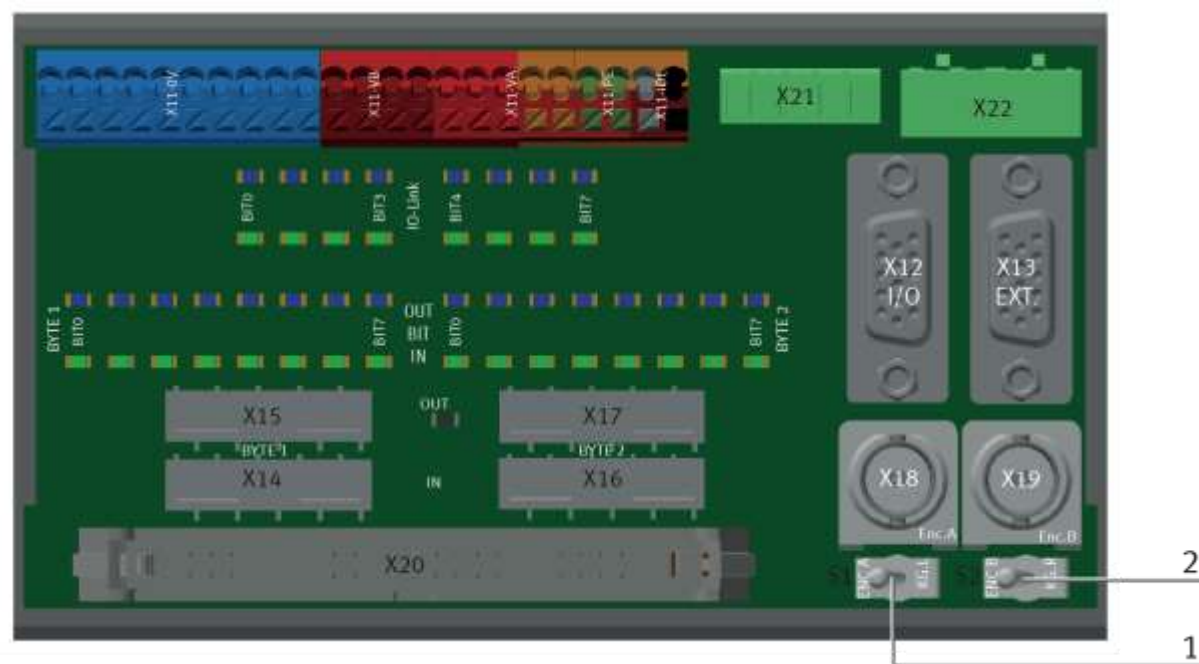


illustration similar

Position	Description
1	Switch S1
2	Switch S2

If the docking extension is used for the robotino, the two toggle switches S1 and S2 must be changed over.

Left position - encoder is used / docking extension deactivated

Right position - Encoder is not used / docking extension activated

12 Message texts and interactive error messages at the HMI

In general, there are three different reporting classes. These are designed as follows

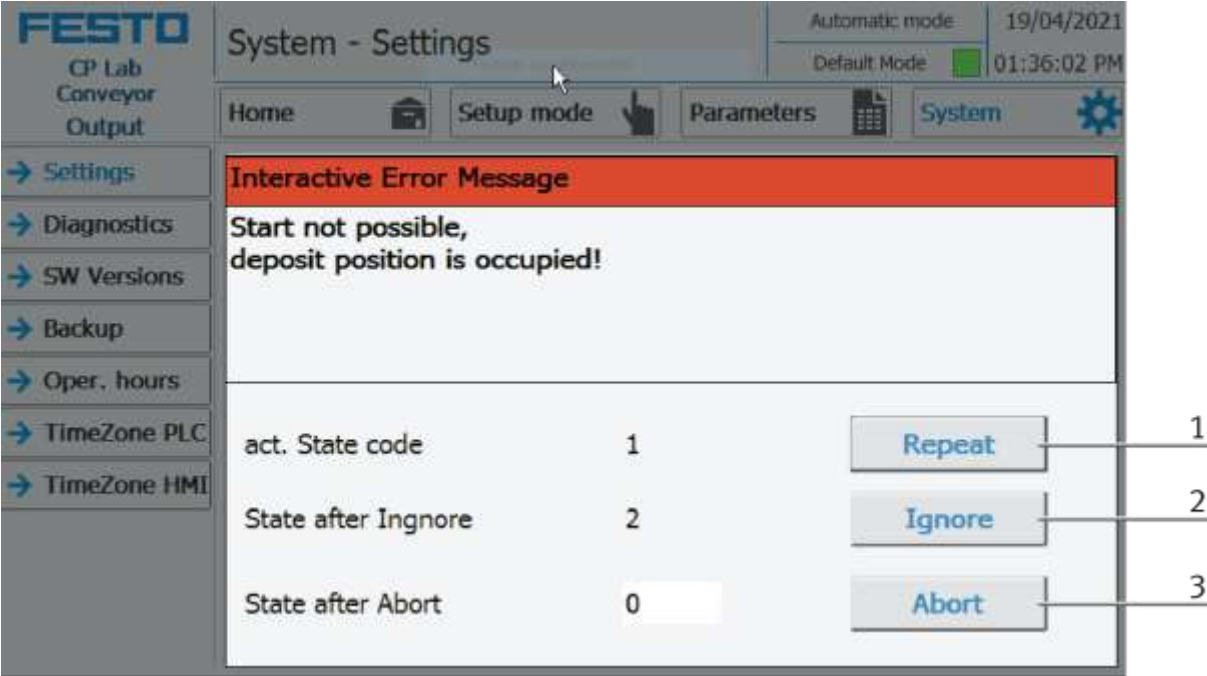
- Message class 0 (displayed red in the message line)
 - the program is immediately stopped and the automatic mode is terminated
 - the cause of the error has to be fixed
 - Then acknowledge the fault and restart the station
- Message class 1 (displayed red in the message line)
 - the program and the automatic mode are stopped at the end of the cycle
 - the cause of the error has to be fixed
 - Then acknowledge the fault and restart the station
- Message class 2 (displayed yellow in the message line)
 - the program and the automatic mode are executed further
 - If the cause of the fault is fixed, the error is automatically acknowledged
- Note
 - Displayed on the HMI but not processed in MES

12.1 Message texts

Actually there are now message texts available.

12.2 Interactive error messages
12.2.1 Default operation

Interactive messages are displayed via a pop-up window at HMI
The Pop Up has three buttons.



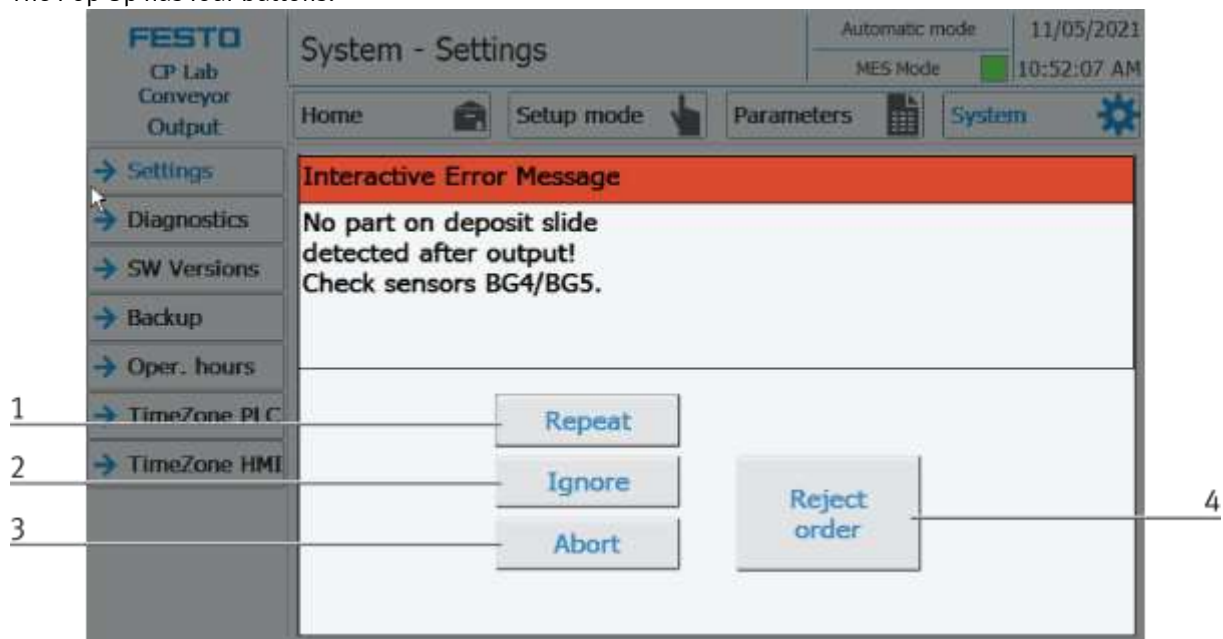
Example application module output - interactive error message in default mode

Position	Note
1	Repeat - An attempt is made to run the application again.
2	Ignore – The error status is ignored; the workpiece carrier receives the status code as indicated in the transition table in the "Initial status" column. The application is no longer executed.
3	Abort – The error status is ignored; the workpiece carrier receives the status code as shown in the input / output field next to the value displayed. This can be changed in this interactive error message window.

12.2.2 MES Operation

Interactive messages are displayed via a pop-up window at HMI

The Pop Up has four buttons.



Example application module output - interactive error message in default mode

Position	Note
1	Repeat - An attempt is made to run the application again with the same parameters.
2	Ignore – The application is not executed, but is treated in the MES as if the order step had been executed without errors.
3	Abort – The application is no longer executed. In the MES, this order position is terminated with an error and canceled, depending on whether an error step has been defined or not.
4	Reject order - the application will not be executed. In the MES, the step of this order position is reset and restarted the next time the workpiece carrier arrives.

12.2.3 General

Value	Text	Fix error
100	Order aborted with errors!	Start order again

13 Spare part list

13.1 Electric parts

Description	Part number	Res.Ident	Use
Proximity sensor SIEN-M8NB-PS-S-L	150395	BG1	Identcode Bit0
Proximity sensor SIEN-M8NB-PS-S-L	150395	BG2	Identcode Bit1
Proximity sensor SIEN-M8NB-PS-S-L	150395	BG3	Identcode Bit2
Proximity sensor SIEN-M8NB-PS-S-L	150395	BG4	Identcode Bit3
Capacitive sensor	117066	BG5	Pallet at left end
Capacitive sensor	117066	BG6	Pallet at right end
Light guide unit D: SOEG-E-Q30-PS-S-2L	165323	KG1	coupling receiver right (n.c.)
Light guide unit D: SOEG-E-Q30-PS-S-2L	165323	KG2	coupling receiver left (n.c.)
Proximity sensor SMT-8M-A-PS-24V-E-0,3-M8D	574334	BG9	Stopper opened
Light guide unit D: SOEG-S-Q30-S-L	165353	GF1	coupling sender left
Light guide unit D: SOEG-S-Q30-S-L	165353	GF2	coupling sender right
Start-up current limiter	150768	QA1	Conveyor motor
Fibre-optic unit SOE4-FO-L-HF2-1P-M8	552796	BG7	incremental encoder Ch. A
Fibre-optic unit SOE4-FO-L-HF2-1P-M8	552796	BG8	incremental encoder Ch. B

13.2 Pneumatic parts

Description	Part number	Res.Ident	Use
Valve solenoid valve VUVG-L10-M52-MT-M5-1P3	574351	MB 1	Stopper down

14 Service and cleaning

The components and systems from Festo Didactic are maintenance-free.

At regular intervals you should have checked:

- the lenses of the optical sensors, fibre optics and reflectors
- the active surface of the proximity switch
- the entire station

can be cleaned with a soft, lint-free cloth or brush.



NOTE

Do not use aggressive or abrasive cleaners.

Protective covers must not be cleaned with alcoholic cleaning agents, there is a risk of embrittlement.


15 Further information and updating

Further information and updates on the technical documentation of Festo Didactic components and systems can be found on the Internet at:

www.ip.festo-didactic.com



16 Disposal

	<div data-bbox="379 286 1406 358"><i>NOTE</i></div> <div data-bbox="379 358 1406 492"><p>Electronic waste contains recyclable materials and must not be disposed of with the domestic waste. Bring electronic waste to a designated municipal collection point.</p></div>
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