

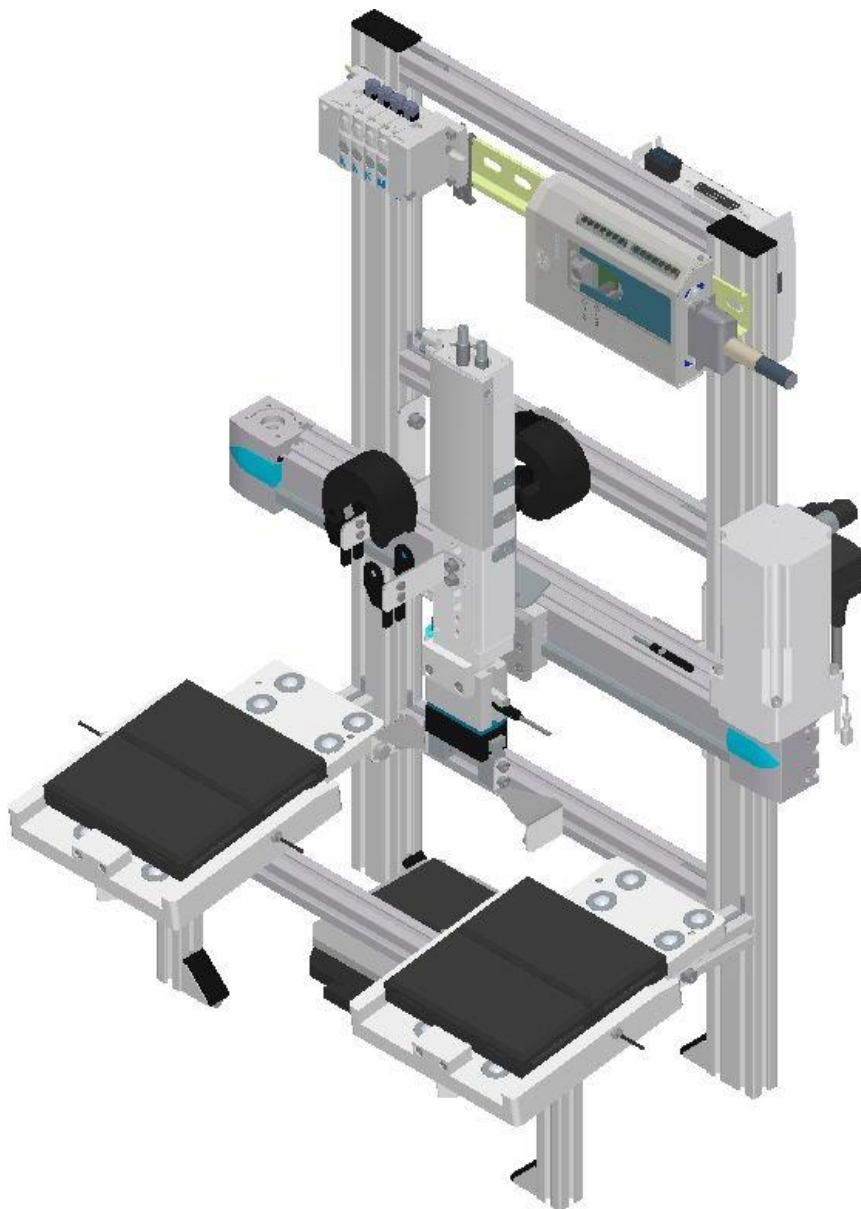
# 8061184

## Output

# FESTO


CP Factory/CP Lab

Translation of the  
original operating  
instructions



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Translation of the original 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.

	 <b>CAUTION</b>
	<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>

### Main document

Associated documents attached:

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

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# 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">  <b>DANGER</b> </div> <p>... indicates an <b>imminently</b> hazardous situation that will result in fatal or severe personal injury if not avoided.</p>
	<div data-bbox="751 817 1029 884">  <b>WARNING</b> </div> <p>... indicates a <b>potentially</b> hazardous situation which may result in fatal or severe personal injury if not avoided.</p>
	<div data-bbox="758 1102 1021 1169">  <b>CAUTION</b> </div> <p>... indicates a <b>potentially</b> hazardous situation that may result in moderate or slight personal injury or severe property damage if not avoided.</p>
	<div data-bbox="842 1408 946 1453"> <b>NOTE</b> </div> <p>... indicates a <b>potentially</b> 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 – lifting heavy loads



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  $\leq 30$  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"><b>WARNING</b></div> <ul data-bbox="395 757 1278 786" style="list-style-type: none"><li>• <b>Malfunctions which could impair safety must be eliminated immediately!</b></li></ul>
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	<div data-bbox="759 900 823 956"></div> <div data-bbox="860 918 1019 958"><b>CAUTION</b></div> <ul data-bbox="395 1005 1382 1115" style="list-style-type: none"><li>• <b>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.</b></li></ul>
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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



	<div style="background-color: #FFD700; text-align: center; padding: 5px;"> <b>CAUTION</b></div> <ul style="list-style-type: none"> <li>Trainees must be supervised by an instructor at all times when working with the components and systems.</li> <li>Observe the specifications included in the technical data for the individual components, and in particular all the safety instructions!</li> <li>Wear your personal protective equipment (safety goggles, safety shoes).</li> <li>Never leave objects lying on the top of protective enclosures. Vibrations could cause such objects to fall off.</li> </ul>
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### 4.2 Mechanical components



	<div style="background-color: #D2691E; text-align: center; padding: 5px;"> <b>WARNING</b></div> <ul style="list-style-type: none"> <li><b>Switch off the power supply!</b> <ul style="list-style-type: none"> <li>– Switch off both the operating power and the control power before commencing work on the circuit.</li> <li>– Never reach into the setup unless it is at a complete standstill.</li> <li>– Be aware of potential overtravel times for the actuators.</li> </ul> </li> <li><b>Risk of injury during troubleshooting!</b> <ul style="list-style-type: none"> <li>– Use a tool such as a screwdriver for actuating sensors.</li> </ul> </li> </ul>
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	<div style="background-color: #FFD700; text-align: center; padding: 5px;"> <b>CAUTION</b></div> <ul style="list-style-type: none"> <li><b>Risk of burns due to hot surfaces</b> <ul style="list-style-type: none"> <li>– Devices can reach high temperatures during operation, as a result of which they can cause burns if touched.</li> </ul> </li> <li><b>Measures to take when maintenance is required.</b> <ul style="list-style-type: none"> <li>– Allow the device to cool off before commencing work.</li> <li>– Use suitable personal protective clothing, e.g. safety safety gloves.</li> </ul> </li> </ul>
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#### 4.3 Electrical components



	 <b>WARNING</b>
	<ul style="list-style-type: none"> <li>• <b>Disconnect from all sources of electrical power!</b> <ul style="list-style-type: none"> <li>– Switch off the power supply before working on the circuit.</li> <li>– 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.</li> <li>– <b>Warning!</b> Capacitors inside the device may still be charged even after being disconnected from all sources of voltage.</li> </ul> </li> <li>• <b>Danger due to malfunction</b> <ul style="list-style-type: none"> <li>– Never place or leave liquids (e.g. drinks) on the station in open containers.</li> <li>– The machine must not be switched on if there is condensation (moisture) on its surface.</li> <li>– Never lay pipes/hoses designed to carry liquid media near the machine.</li> </ul> </li> <li>• <b>Electric shock due to connection to unsuitable power supply!</b> <ul style="list-style-type: none"> <li>– When devices are connected to an unsuitable power supply, exposed components can cause dangerous electrical voltage that can lead to severe or fatal injury.</li> <li>– 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.</li> </ul> </li> <li>• <b>Electric shock when there is no protective grounding in place</b> <ul style="list-style-type: none"> <li>– 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.</li> <li>– Ground the device in accordance with the applicable regulations.</li> </ul> </li> </ul>

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

	 <b>CAUTION</b>
	<ul style="list-style-type: none"> <li>• <b>Always ensure that your connecting cables are designed for use with the electrical connections in question.</b></li> <li>• <b>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.</b></li> <li>• <b>Do not lay cables over hot surfaces.</b> <ul style="list-style-type: none"> <li>– Hot surfaces are identified with a corresponding warning symbol.</li> </ul> </li> <li>• <b>Make sure that connecting cables are not subjected to continuous tensile loads.</b></li> <li>• <b>Devices with a grounding terminal must always be grounded.</b> <ul style="list-style-type: none"> <li>– 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).</li> <li>– Some devices have high leakage current. These devices must be fitted with a grounding conductor for additional grounding.</li> </ul> </li> <li>• <b>When replacing fuses, always use specified fuses with the correct current rating and tripping characteristics.</b></li> <li>• <b>The device is not equipped with a built-in fuse unless otherwise specified in the technical data.</b></li> <li>• <b>Safe operation of the device is not possible in the event of any of the following circumstances:</b> <ul style="list-style-type: none"> <li>– Visible damage</li> <li>– Malfunction</li> <li>– Inappropriate storage</li> <li>– Incorrect transport</li> </ul> <p>Switch off the power supply immediately.</p> </li> <li>• <b>Protect the device to prevent it from being restarted accidentally.</b></li> </ul>

#### 4.4 Pneumatic components

	<div style="background-color: #e67e22; color: white; padding: 5px; text-align: center;">  <b>WARNING</b> </div> <ul style="list-style-type: none"> <li>• <b>Depressurize the system!</b> <ul style="list-style-type: none"> <li>– Switch off the compressed air supply before working on the circuit.</li> <li>– Check the system using pressure gauges to make sure that the entire circuit is fully depressurized.</li> <li>– 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.</li> </ul> </li> <li>• <b>Risk of injury when switching on compressed air!</b> Cylinders may advance and retract automatically.</li> <li>• <b>Risk of accident due to advancing cylinders!</b> <ul style="list-style-type: none"> <li>– Always position pneumatic cylinders so that the piston rod's working space is unobstructed along its entire stroke range.</li> <li>– Make sure that the piston rod cannot collide with any of the rigid components in the setup.</li> </ul> </li> <li>• <b>Risk of accident due to pneumatic tubing slipping off!</b> <ul style="list-style-type: none"> <li>– Use shortest barbed tubing connectors possible.</li> <li>– If pneumatic tubing slips off, switch off the compressed air supply immediately.</li> </ul> </li> <li>• <b>Do not exceed the maximum permissible pressure of 600 kPa (6 bar).</b></li> <li>• <b>Do not switch on the compressed air until all the barbed tubing connectors have been connected and secured.</b></li> <li>• <b>Do not disconnect pneumatic tubing while it is under pressure.</b> <ul style="list-style-type: none"> <li>– Do not attempt to seal or plug pneumatic tubing or plug connectors with your hands or fingers.</li> </ul> </li> <li>• <b>Check the condition of the condensate in the service unit regularly. If necessary, drain the condensate and dispose of it properly.</b></li> </ul>
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	<div data-bbox="758 192 1021 257"> <b>CAUTION</b></div> <ul style="list-style-type: none"><li>• <b>Setting up pneumatic circuits</b><ul style="list-style-type: none"><li>– Connect the devices with plastic tubing with an outside diameter of 4 or 6 mm.</li><li>– Push the pneumatic tubing into the push-in connector as far as it will go.</li></ul></li><li>• <b>Dismantling pneumatic circuits</b><ul style="list-style-type: none"><li>– Switch off the compressed air supply before dismantling the circuit.</li><li>– Press the blue release ring down so that the tubing can be pulled out.</li></ul></li><li>• <b>Noise due to escaping compressed air</b><ul style="list-style-type: none"><li>– 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.</li><li>– All of the exhaust ports on the components included in the equipment set are equipped with mufflers. Do not remove these mufflers.</li></ul></li></ul>
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#### 4.5 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.

#### 4.6 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.

	 <b>WARNING</b>
	<ul style="list-style-type: none"> <li>• <b>Unsecure operating conditions due to software tampering</b> <ul style="list-style-type: none"> <li>– 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.</li> <li>– Keep your software up to date.</li> <li>– 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.</li> <li>– Make sure that all the products you have installed are incorporated into your overarching industrial security concept.</li> <li>– Use suitable measures, such as a virus scanner, to protect files save on exchangeable storage media from malware.</li> </ul> </li> </ul>



#### 4.7 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 data-bbox="751 792 815 851"></div> <div data-bbox="847 808 1029 851"><b>WARNING</b></div> <ul style="list-style-type: none"><li>• <b>This product is designed for use in industrial environments, and may cause malfunctions if used in domestic or small commercial environments.</b></li></ul>
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#### **4.8 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).

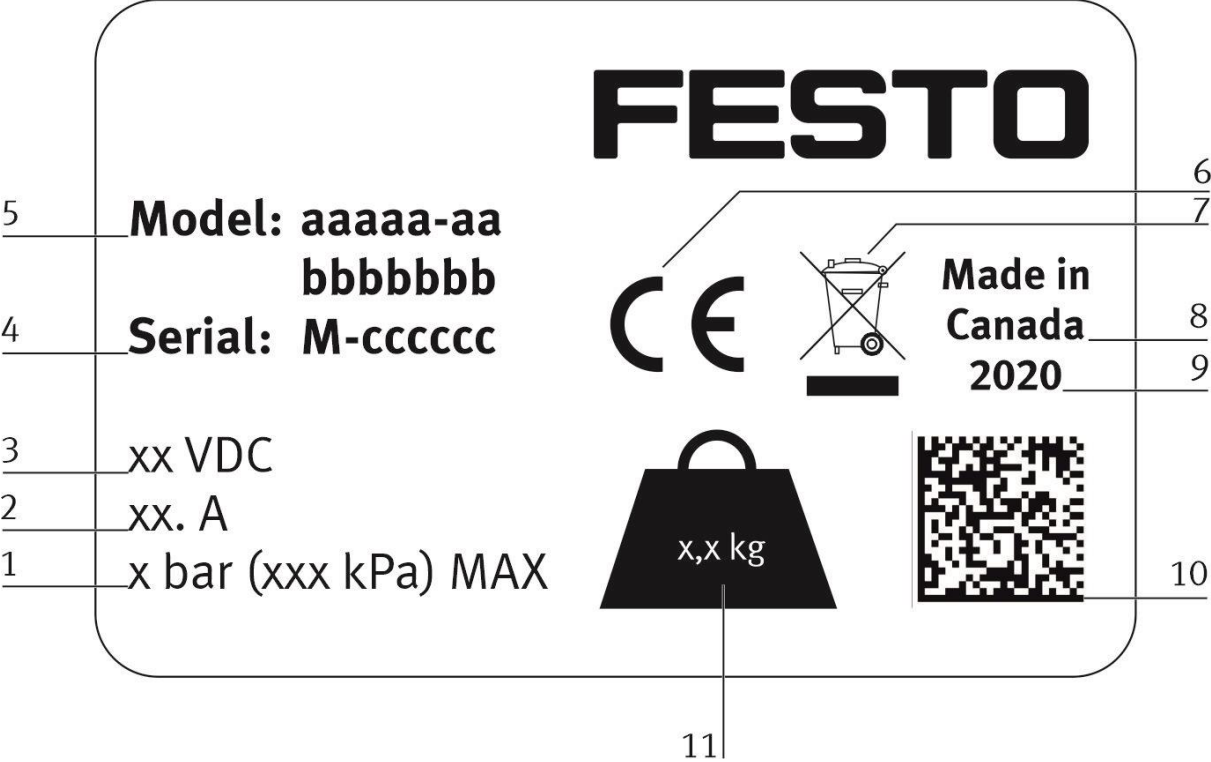
See the Environmental Requirements section (contamination level) for more details.

## 4.9 Transport

	<div data-bbox="751 315 1029 376"> <b>WARNING</b></div> <ul style="list-style-type: none"><li>• <b>Danger due to tipping over</b><ul style="list-style-type: none"><li>– 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.</li><li>– Stations with attachments at height will have a high center of gravity.</li><li>– Take care to avoid tipping over during transportation.</li></ul></li></ul>
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	<div data-bbox="842 779 946 817"><b>NOTE</b></div> <ul style="list-style-type: none"><li>• <b>Station contains delicate components!</b><ul style="list-style-type: none"><li>– Take care not to shake during transportation</li></ul></li><li>• <b>The station is only permitted for installation on solid, non-vibrating surfaces.</b><ul style="list-style-type: none"><li>– Make sure that the ground underneath the station has sufficient load-bearing capacity.</li></ul></li></ul>
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4.10 Name plates



Name plate example

Position	Description
1	Maximum pressure pneumatic (if available)
2	current consumption
3	Operating voltage
4	Serial number
5	Type number (Ordernumber) aaaaaa-aa (canadian nomenclature) bbbbbbbb (german nomenclature)
6	CE idenification
7	WEEE identification
8	Country of origin
9	Production year
10	Data Matrix Code (Type-and serial number)
11	Weight

## 4.11 CE Declaration of Conformity

(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 хармонизация.

(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.

(EL) Η παρούσα δήλωση συμμόρφωσης εκδίδεται με αποκλειστική ευθύνη του κατασκευαστή. Ο περιγραφόμενος στόχος της δήλωσης είναι σύμφωνος με τη σχετική ενωσιακή νομοθεσία εναρμόνισης.

(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. Kirjelatud deklareeritav toode on kooskõlas asjaomaste liidu ühtlustamisaktidega.

(FI) Tämä vaatimustenmukaisuusvakuutus on annettu valmistajan yksinomaisella vastuulla. Kuvattu vakuutuksen kohde on asiaa koskevan unionin yhdenmukais-tamisinsäännön 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 nyilatko-zat tárgyá megfelel a vonatkozó uniós har-monizációs jogszabályoknak.

(IT) 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 atitikties deklaracija išduota tik gamintojo atsakomybe. Aprašytas deklaracijos objekto atitinka susijusius derinamuosius Sąjungos teisės aktus.

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

(NL) Deze conformiteitsverklaring wordt verstrekt onder volledige verantwoordelijkheid van de fabrikant. Het beschreven voorwerp is in overeenstemming 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) Prezenta declarație 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 je v zhode s príslušnými harmonizačnými právnymi predpismi Unie.

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

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

(TR) Bu Uygunluk Belgesi tamamen üreticinin sorumluluğunda altındadır. Belge de açıklanan obje, Birliğin ilgili uyum mevzuatına uygundur.

# FESTO

8101137  
2018-10-17

EG-Konformitätserklärung

EU Declaration of Conformity

Декларация за съответствие на ЕС

Prohlášení o shodě ES

EF-overensstemmelseserklæring

Δηλώση Συμμόρφωσης ΕΚ

Declaración de conformidad CE

EU vastavusdeklaratsioon

EY-vaatimustenmukaisuusvakuutus

Déclaration CE de conformité

EK megfelelőségi nyilatkozat

Dichiarazione di conformità EU

EB atitikties deklaracija

EK atbilstības deklarācija

EG-verklaring van

overeenstemming

Deklaracja zgodności WE

Declaração de conformidade CE

Declarație de conformitate CE

Vyhlásenie o zhode ES

Izjava ES o skladnosti

EG-försäkran om Överensstämmelse

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 Didactic Ltée/Ltd. • 675 rue du Carbone • Québec, QC G2N 2K7 • CANADA • www.festo-didactic.com

8101137 – DoC0039

# FESTO

8101137  
2018-10-17

8050101	CP-LAB STATION
8050102	CP-LAB STATION
8058667	STATION CP BRIDGE
8032508	STACKING MAGAZINE
8061362	MEASURING STATION
8032510	MODULE DRILLING
8043598	MODULE IDRILLING
8038567	MODULE MUSCLE PRESS
8032507	MODULE PRESS
8032509	MODULE TURNING
8061184	MODULE WORKPIECE OUT
8032511	MODULE CAMERA INSP
8065842	MODULE LABELING
8032512	MODULE HEAT TUNNEL
8068413	MODULE PICK BY LIGHT
8092833	CP LAB STD CFG 4 STATIONS
8092834	CP LAB STD CFG 6 STATIONS
8092835	CP LAB STD CFG 8 STATIONS
8092836	CP LAB STD CFG 10 STATIONS
2006/42/EC	EN 60204-1:2006
2014/30/EU	EN 61326-1:2006
2011/65/EU	EN 50581:2012

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*Francis Larrivée*

Francis Larrivée Ing.  
Engineering- Festo Didactic

*Philippe Drolet*


Philippe Drolet  
Product Compliance – Festo Didactic

#### 4.12 General product safety

	<div data-bbox="751 315 818 371"></div> <div data-bbox="855 331 1027 371"><b>WARNING</b></div> <ul style="list-style-type: none"><li>• <b>General product safety, CE conformity</b><ul style="list-style-type: none"><li>– The product fulfills the requirements of all applicable EU directives. We confirm this with the CE mark.</li><li>– As a consequence of Changes (hardware / software) Additions or improper use</li><li>– Product safety can no longer be guaranteed by the operator.</li><li>– In this case, the manufacturer's CE declaration of conformity expires. The operator must re-evaluate the safety and determine the CE conformity.</li></ul></li></ul>
---	---

#### 4.13 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.

	<div data-bbox="754 394 818 450"></div> <div data-bbox="852 412 1027 450"><b>WARNING</b></div> <ul style="list-style-type: none"><li>• <b>Damage to the safety window</b><ul style="list-style-type: none"><li>– Windows must not be cleaned using aggressive or alcoholic cleaning agents. Risk of brittleness and breakage!</li><li>– This protective device must be replaced if it shows any signs of damage. Please contact our Service department to arrange this.</li></ul></li></ul>
---	---

##### 4.13.1 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.

##### 4.13.2 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.

##### 4.13.3 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

Parameter	Value
<b>Electrics</b>	
Power supply	24 V DC, 4.5 A
Digital inputs	5
Digital outputs	4
<b>Compressed air</b>	
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
<b>Ambient conditions</b>	
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 <sub>pA</sub> < 70 dB
<b>Certification</b>	
CE marking in accordance with:	Machinery Directive EMC Directive RoHS Directive
EMC environment	Industrial environment, Class A (in acc. with EN 55011)
<b>Measurements</b>	
Length	463 mm
Width	300 mm
Height	603 mm
Weight	Approx 12 kg
<b>Subject to change</b>	

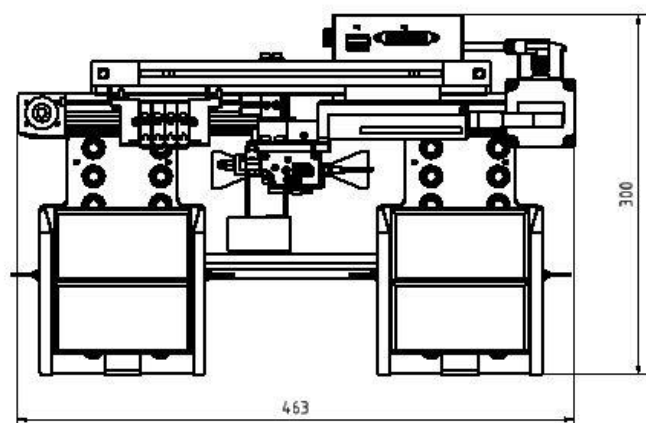
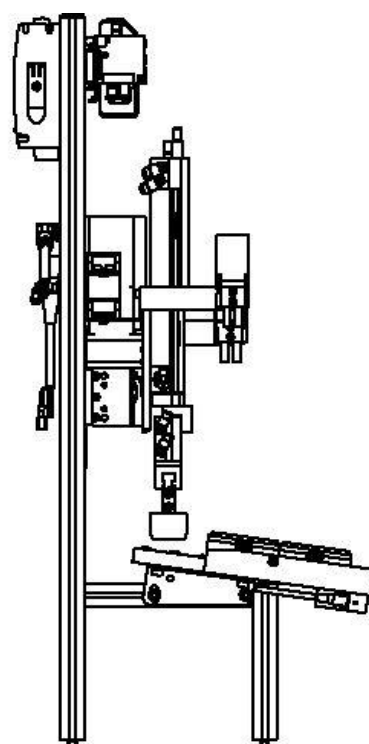
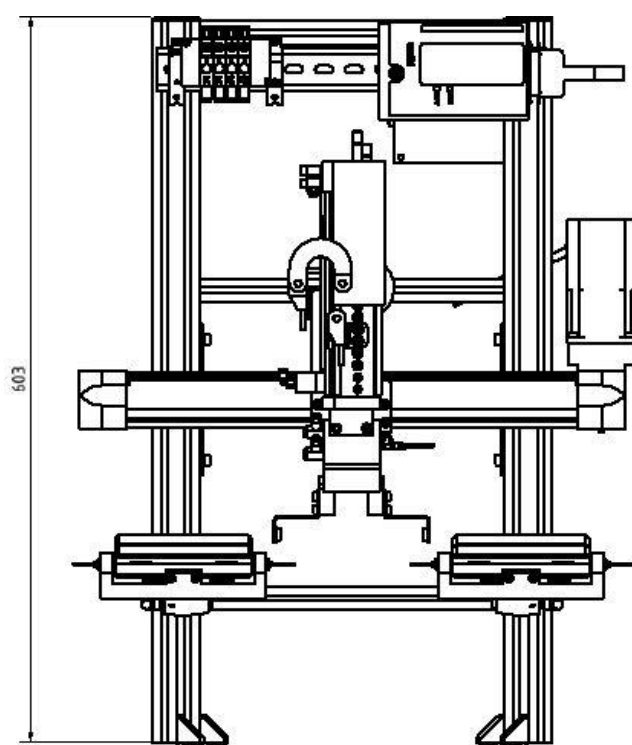








Illustration similar


## 6 Design and Function

### 6.1 Transport

	<div style="text-align: center; background-color: #d95319; color: white; padding: 5px;">  <b>WARNING</b> </div> <ul style="list-style-type: none"> <li>• <b>Damage to transport equipment when moving heavy machines/machine sections</b> <ul style="list-style-type: none"> <li>– 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.</li> <li>– Always use suitable transport equipment.</li> <li>– Always use the lifting points provided to move the machine/machine sections.</li> <li>– Always use the designated load take-up point.</li> </ul> </li> </ul>
---	---

	<div style="text-align: center; background-color: #d95319; color: white; padding: 5px;">  <b>WARNING</b> </div> <ul style="list-style-type: none"> <li>• <b>Securing transit routes</b> <ul style="list-style-type: none"> <li>– 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.</li> </ul> </li> <li>• <b>Caution</b> <ul style="list-style-type: none"> <li>– 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.</li> </ul> </li> </ul>
--	--

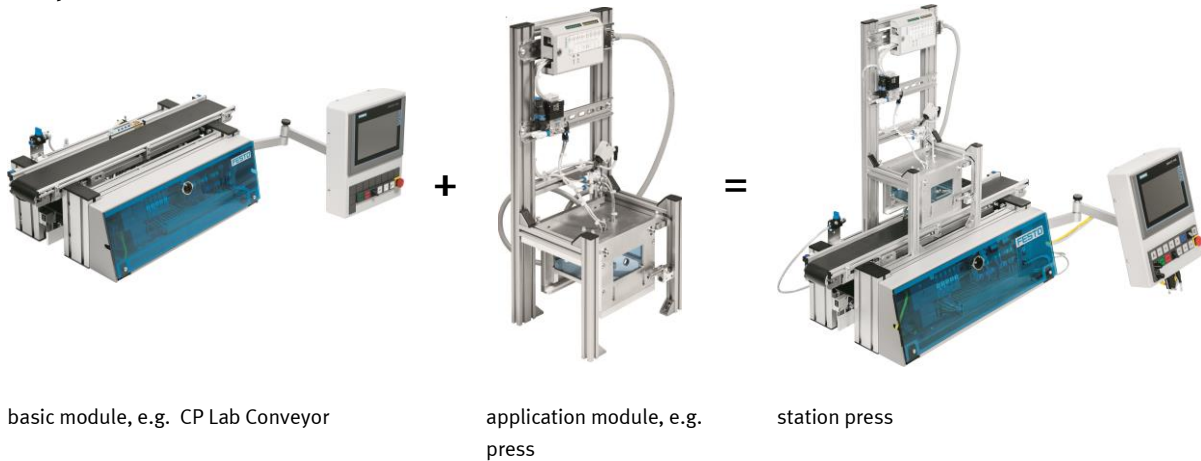
	<div style="text-align: center; background-color: #d95319; color: white; padding: 5px;">  <b>WARNING</b> </div> <ul style="list-style-type: none"> <li>• <b>Danger of crushing for hands/feet</b> <ul style="list-style-type: none"> <li>– It is not permitted to grip onto or under the feet when handling the machine, as there is an increased risk of hands or feet getting crushed or trapped in these areas.</li> <li>– When setting down the station, make sure no persons have their feet under the machine's feet.</li> </ul> </li> </ul>
---	---

	<div data-bbox="834 248 948 291"><i><b>NOTE</b></i></div> <ul data-bbox="438 336 1385 685" style="list-style-type: none"><li>– When opening the transport box, any additional components must be secured to prevent them from falling out, and removed first.</li><li>– 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.</li><li>– 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.</li><li>– Check that all the profile connectors are seated correctly using a size 4 – 6 Allen key. Unavoidable vibrations can loosen the connectors during transport.</li></ul>
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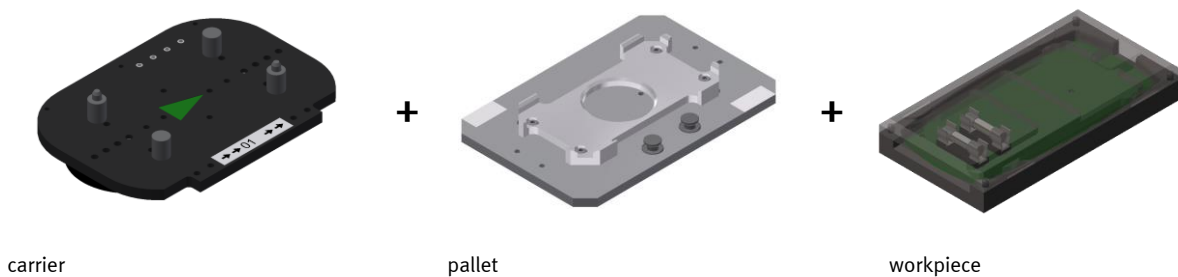
## 6.2 Overview of the System

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 press is attached to a basic module, it becomes a station.

### Example

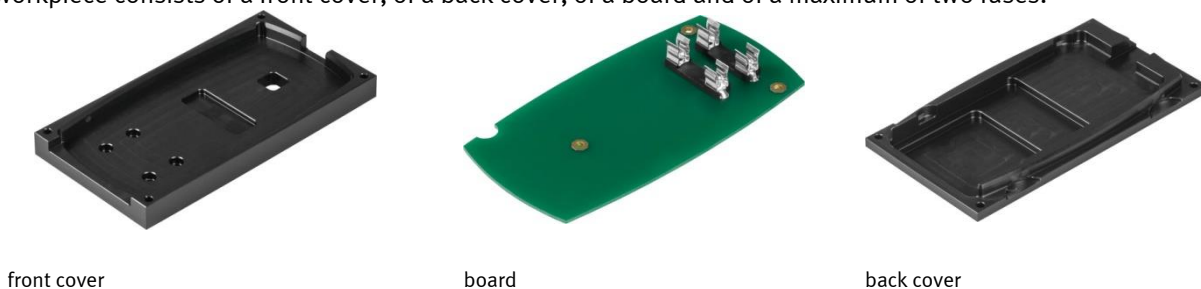


If several stations are put in a row one behind the other, this will form a production line.



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.



### 6.3 The application module output

The application module output is designed for

- Using an electro-pneumatic, two-axis handling device, the good / bad parts must be dispensed on two ramps.

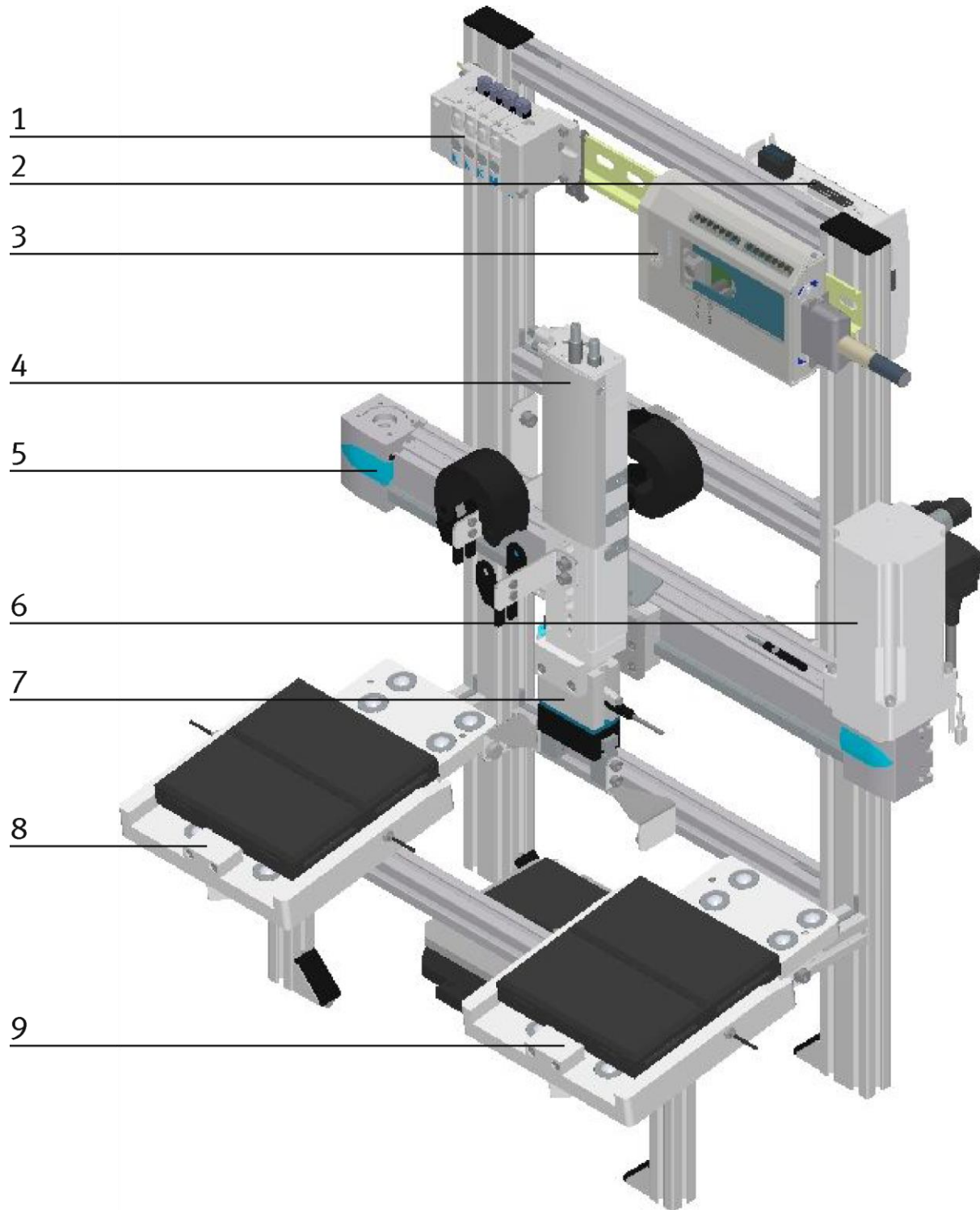


Illustration similar

Position	Description	Part name	Order number
1	Valve terminal	80P-10-1LIH-PB-N-SLC-4JK-T	525675
2	Motor controller	CMMO-ST-C5-1-DIOP	1512316
3	I/O terminal		
4	Z-axis	DGSL-10-100-E3-Y3A	543905
5	X-axis	EGC-50-300-TB-KF-0H-GK	556812
6	Motor X-axis	EMMS-ST-57-S-SE-G2	1370475
7	Gripper	DHPS-16-A	1254043
8	Storage position left		
9	Storage position right		

## 6.4 Function

The carrier is detected by a light barrier when it is fed into the application module and then stopped. The application module removes a good/bad part from a carrier and places it on one of the two ramps. The selection of the good/bad ramp can be freely defined in MES. A maximum of two parts can be stored on each ramp. The X-axis must not return to the center position until the part has slipped downwards on the ramp. The Z axis has only an upper and a lower position.

## 6.5 Process description

### Start Conditions

- All connections have been made properly

### Starting position

- The Z axis must be in the upper position
- At least 1 space must be available on the ramps
- The X axis must be referenced
- The gripper must be opened

### Procedure

1. If a carrier is transported through the light barrier of the application module output, the carrier is stopped and an automatic sequence is started.
2. The X-axis moves over the center position
3. The Z axis is moved downwards and the gripper is closed
4. The Z-axis moves upwards
5. Depending on the condition (good or bad part), the X axis moves to one of the ramps
6. The gripper is opened to place the workpiece on the ramp
7. If the workpiece has slipped downwards (detection by the sensors), the X axis moves to the center position.

Note: When you place the part, the Z-axis does not move.

## 6.6 Electrical Connections

### 6.6.1 I/O connections

The application module is connected to the electrical board of the module via I/O. The I/O box (1) of the application module is connected to the I/O terminal (2) on the module's electrical board.

The example refers to the connection to a basic module linear, it is possible that the terminal names of the I/O terminal differ when connected to another module.

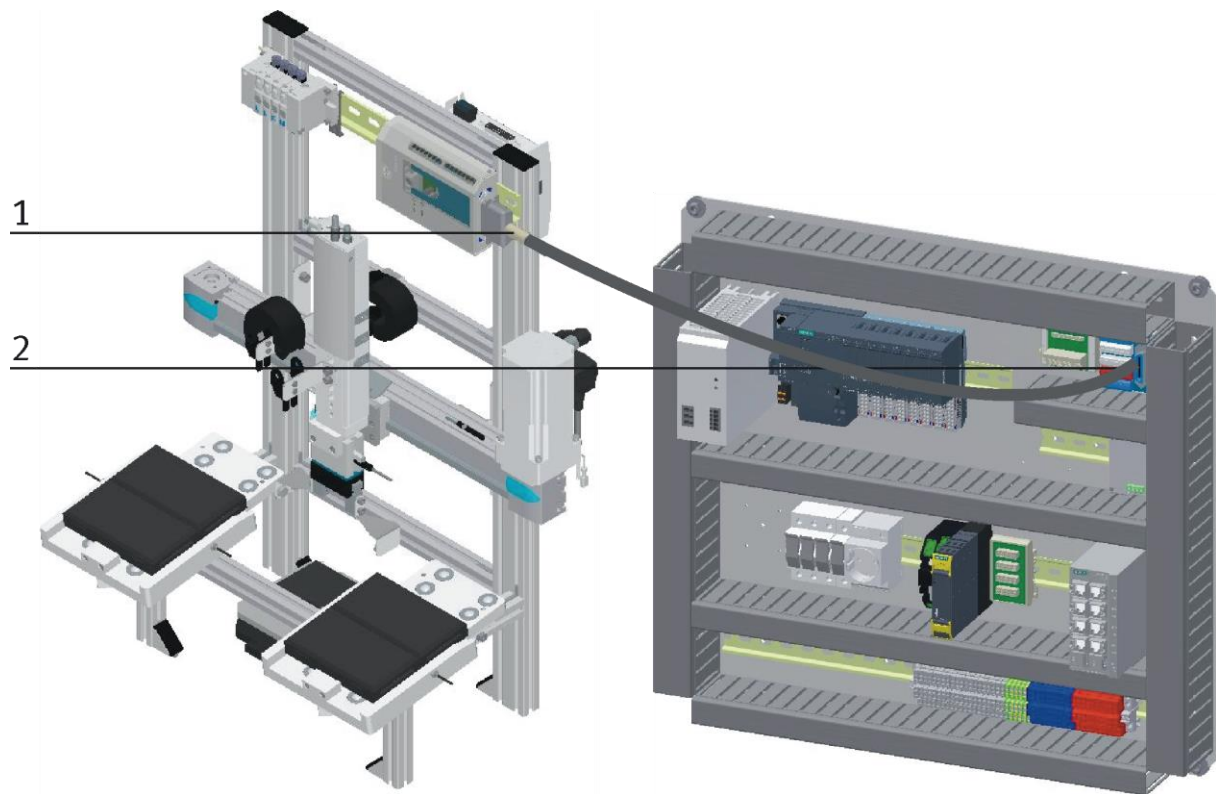


Illustration similar

Electrical connection by I/O example



### 6.6.2 I/O Box XD1

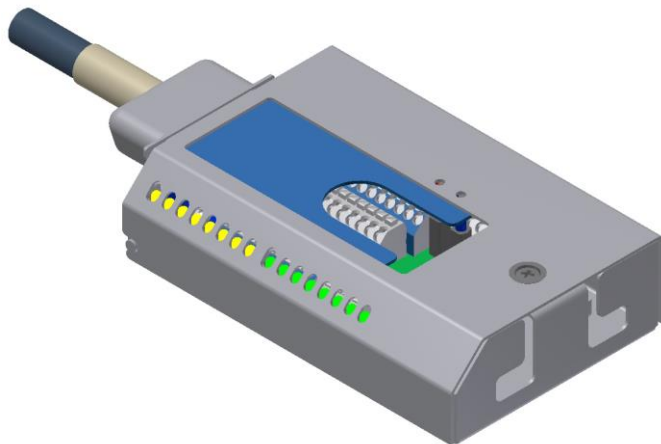


Illustration similar

#### Box Inputs

Designation	Equipment identifier	Application	Application SysLink
Lifting cylinder upper position	BG1	XD1 / XK:I0	XD1:XS13
Lifting cylinder lower position	BG2	XD1 / XK:I1	XD1:XS14
Gripper opened	BG3	XD1 / XK:I2	XD1:XS15
Depositing place left occupied	BG4	XD1 / XK:I3	XD1:XS16
Depositing place right occupied	BG5	XD1 / XK:I4	XD1:XS17
Referenced	BG6	XD1 / XK:I5	XD1:XS18
Motion complete		XD1 / XK:I6	XD1:XS19
Ready	BG7	XD1 / XK:I7	XD1:XS20

#### Box Outputs

Designation	Equipment identifier	Application	Application SysLink
Z-axis upward	MB1	XD1 / XK:O0	XD1:XS1
Z-axis downward	MB2	XD1 / XK:O1	XD1:XS2
Open cylinder clamp unit	MB3	XD1 / XK:O2	XD1:XS3
Open gripper	MB4	XD1 / XK:O3	XD1:XS4
Controller enable	MB5	XD1 / XK:O4	XD1:XS5
Traversing selection	MB6	XD1 / XK:O5	XD1:XS6
Bit 1	MB7	XD1 / XK:O6	XD1:XS7
Start positioning		XD1 / XK:O7	XD1:XS8

### 6.6.3 I/O Terminal XD15

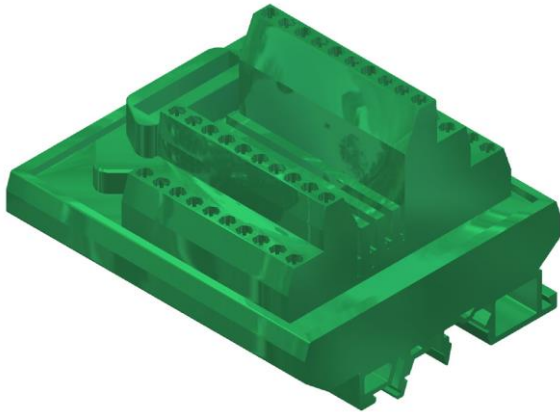


Illustration similar


#### Terminal Inputs

Designation	Terminal Board SysLink	Terminal Board	Control Unit Inlet
Lifting cylinder upper position	XD15:XS13	XD15 / XK:I0	K5-KF4:1 / I2.0
Lifting cylinder lower position	XD15:XS14	XD15 / XK:I1	K5-KF4:2 / I2.1
Gripper opened	XD15:XS15	XD15 / XK:I2	K5-KF4:3 / I2.2
Depositing place left occupied	XD15:XS16	XD15 / XK:I3	K5-KF4:4 / I2.3
Depositing place right occupied	XD15:XS17	XD15 / XK:I4	K5-KF4:5 / I2.4
Referenced	XD15:XS18	XD15 / XK:I5	K5-KF4:6 / I2.5
Motion complete	XD15:XS19	XD15 / XK:I6	K5-KF4:7 / I2.6
Ready	XD15:XS20	XD15 / XK:I7	K5-KF4:8 / I2.7


#### Terminal Outputs

Designation	Terminal Board SysLink	Terminal Board	Control Unit Outlet
Z-axis upward	XD15:XS1	XD15 / XK:O0	K5-KF12:1 / Q2.0
Z-axis downward	XD15:XS2	XD15 / XK:O1	K5-KF12:2 / Q2.1
Open cylinder clamp unit	XD15:XS3	XD15 / XK:O2	K5-KF12:3 / Q2.2
Open gripper	XD15:XS4	XD15 / XK:O3	K5-KF12:4 / Q2.3
Controller enable	XD15:XS5	XD15 / XK:O4	K5-KF12:5 / Q2.4
Traversing selection	XD15:XS6	XD15 / XK:O5	K5-KF12:6 / Q2.5
Bit 1	XD15:XS7	XD15 / XK:O6	K5-KF12:7 / Q2.6
Start positioning	XD15:XS1	XD15 / XK:O0	K5-KF12:1 / Q2.0

## 7 Commissioning

	<p style="text-align: center;"><b><i>NOTE</i></b></p> <ul style="list-style-type: none"> <li>– The following applies to the start-up as well as to the restart.</li> </ul>
---	--

- The CP Application Module is delivered pre-assembled.
- All attachment parts are individually packaged.
- All components, tubings and cabling have been clearly marked in order to guarantee a problem-free retrieving of all connections.
- For the operation within a CP Factory/Lab System, the CP Application Module has to be put on and attached to a basic module.

	<p style="text-align: center;"><b><i>NOTE</i></b></p> <ul style="list-style-type: none"> <li>– You can read the general installation instructions in the manual of your basic module. The following instructions apply particularly to the CP Application Module.</li> </ul>
---	--

### 7.1 Workplace

The commissioning of the CP Application Module requires:

- a CP Application Module
- a basic module CP Factory or a basic module CP Lab Conveyor for the installation of the CP Application Module
- a SysLink cable for the connection between the I/O terminal of the CP Application Module and the basic module CP Factory
- an Ethernet cable for the connection of the motor controller (option)
- an on-site electrical connection in the room, see data sheet basic module
- an on-site pneumatically connection in the room, see data sheet basic module

## 7.2 Visual Inspection

	 <b>WARNING</b>
	<ul style="list-style-type: none"> <li>• <b>Any damages must always be repaired instantly.</b></li> </ul>

Visual inspection has to be carried out prior to every commissioning!

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

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

## 7.3 Safety Regulations


	 <b>WARNING</b>
	<ul style="list-style-type: none"> <li>• <b>Any damages must always be repaired instantly.</b></li> </ul>

The CP Application Module may only be operated on the following conditions:

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

7.4 Assembly

7.4.1 Assembly of an CP application module to a CP Lab conveyor



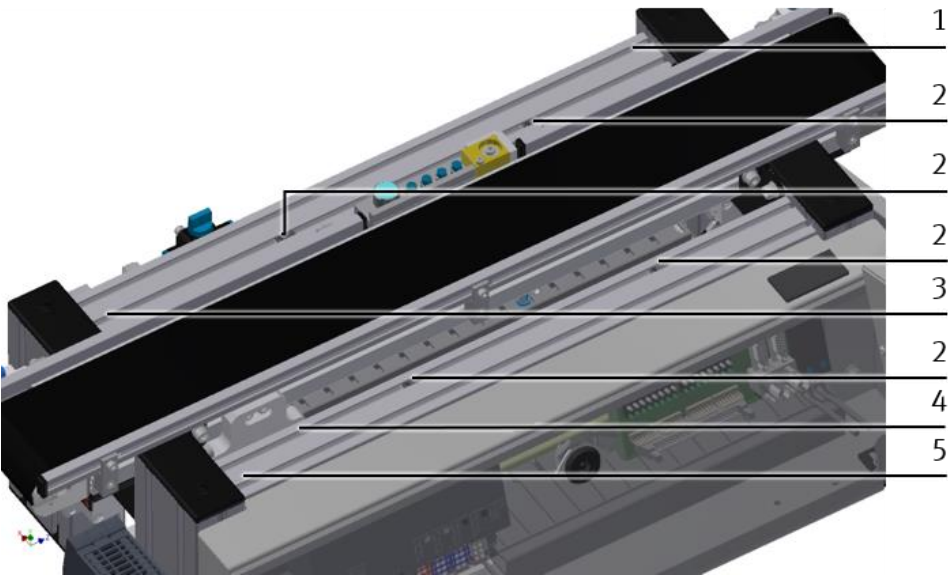
**NOTE**

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

Positioning slot nuts in the cross profiles of the 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 CP Lab Conveyor.
- Then put two additional M5-slot nuts (2) into the inner back slot of the cross profile (3) of the 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

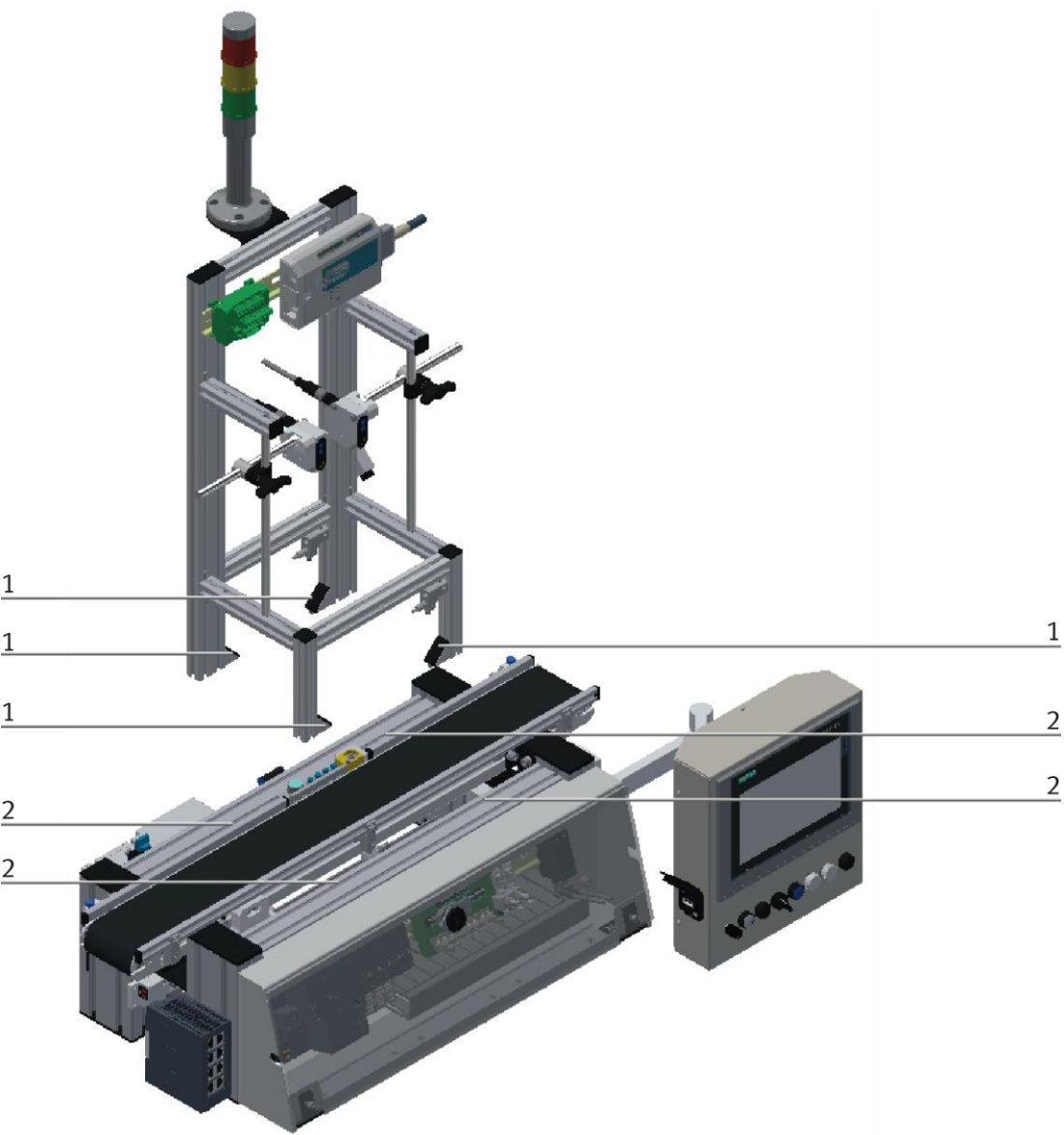
Attaching the application module to the CP Lab Conveyor

- Put the CP application module on the 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.

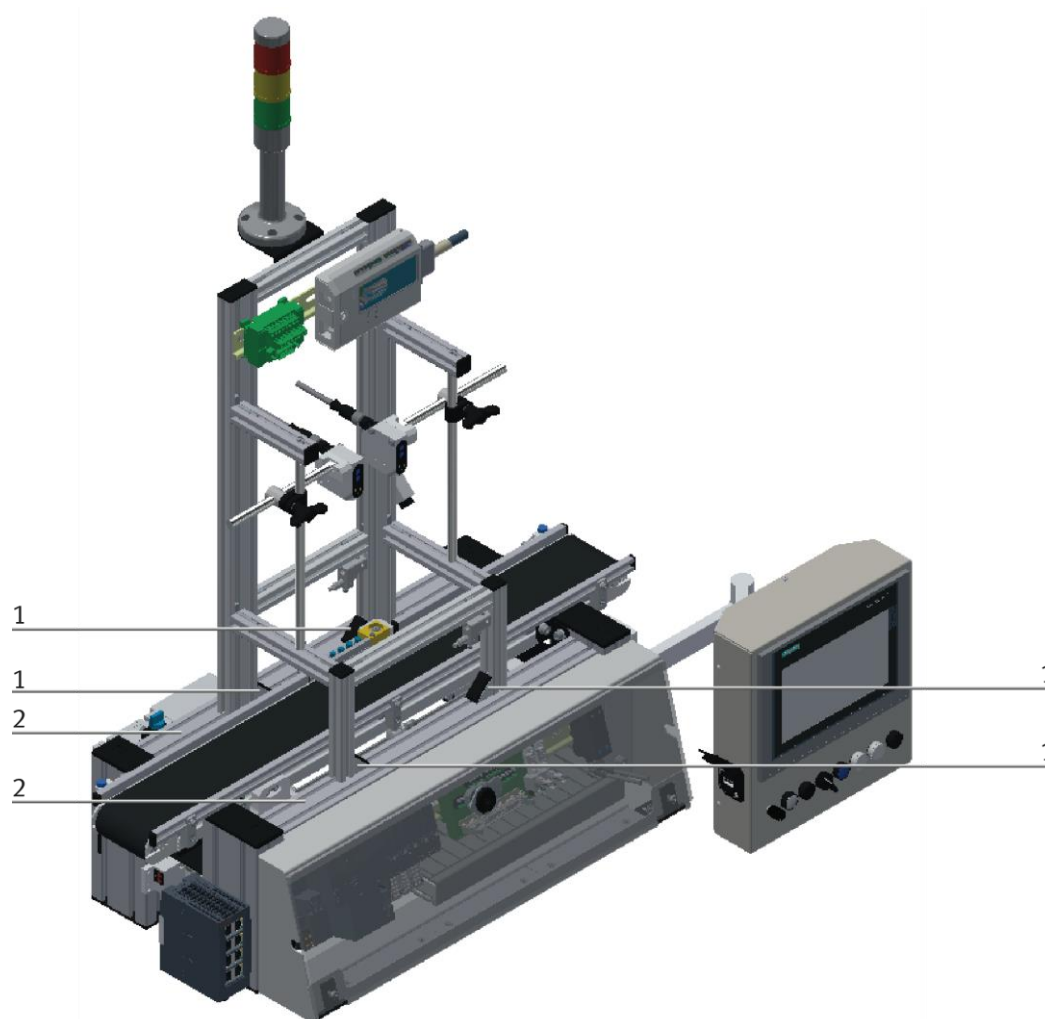


How to put on the CP application module / illustration similar

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

### Adjusting the CP application module and fixing it on the 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 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	CP Lab Conveyor: cross profile

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

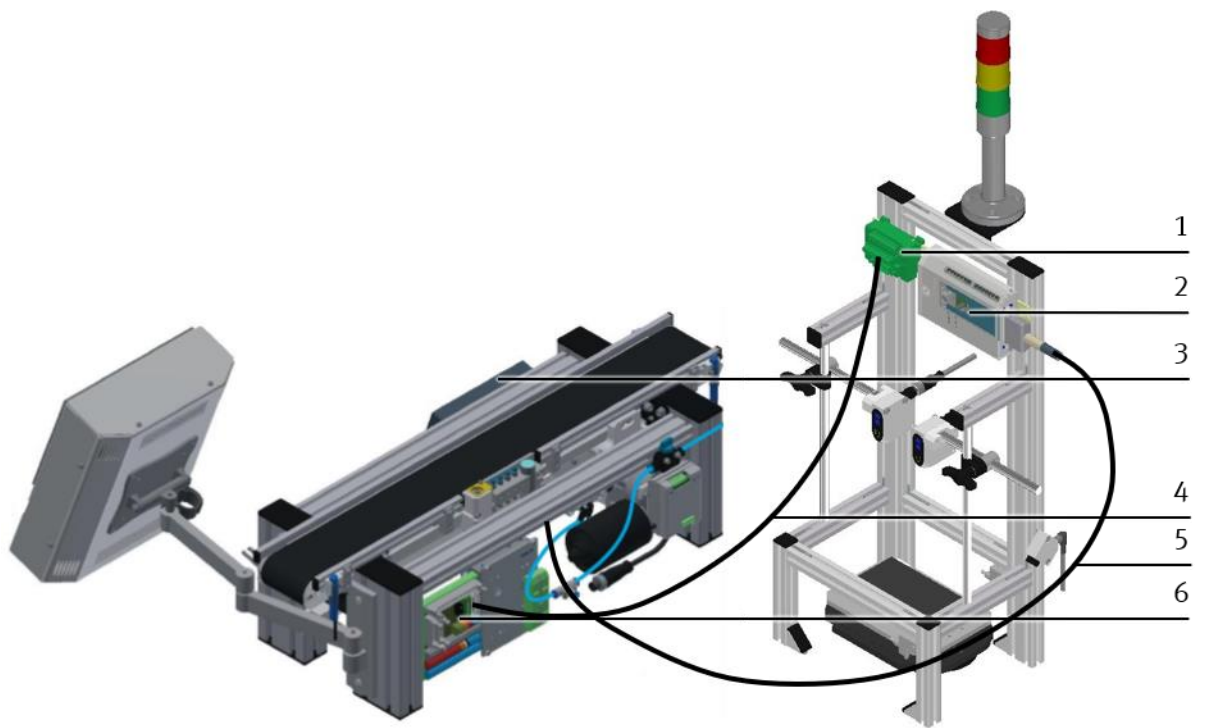


**NOTE**

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

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

- Connect the I/O terminal (2) of the CP application module with the control (3) of the 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 CP Lab Conveyor.



Electrical connections / illustration similar

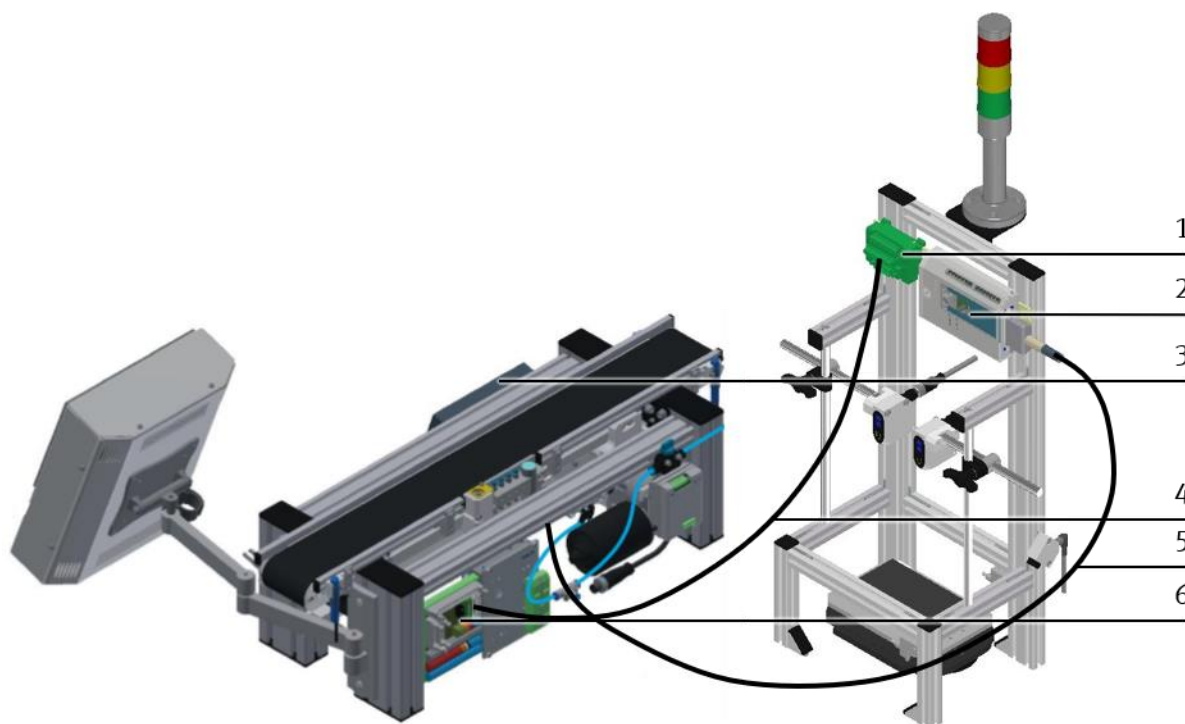
Position	Description
1	CP application module: analogue terminal (+BG-XD2A)
2	CP application module: I/O terminal (+BG-XD1)
3	CP Lab Conveyor: control or decentralized periphery
4	connecting cable with15-pin standard D-Sub-plugs
5	connecting cable with a SysLink-plug (SysLink-cable)
6	CP Lab Conveyor: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



### D-Sub-interface for analogue signals

The CP application module produces two analogue output signals with the distance sensors. These are put on the analogue terminal (1) and must be connected with the analogue inputs of the CP Lab conveyor:

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

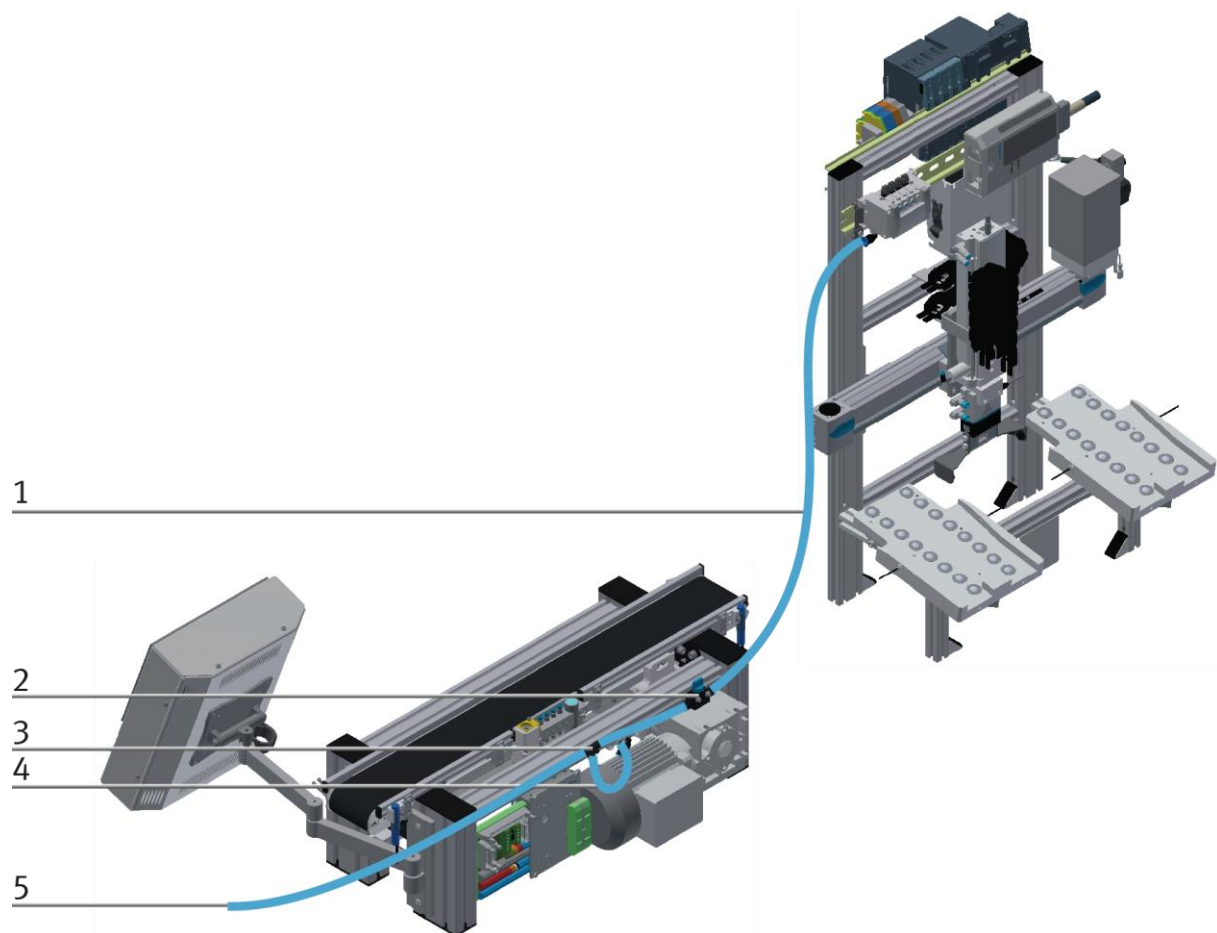


Electrical connections / illustration similar

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

### 7.4.3 Pneumatic connection from 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 conveyor is also supplied with a T-connector (4).



Pneumatically connect application module / illustration similar

#### 7.4.4 Assembly of an CP application module to a CP Factory basic module



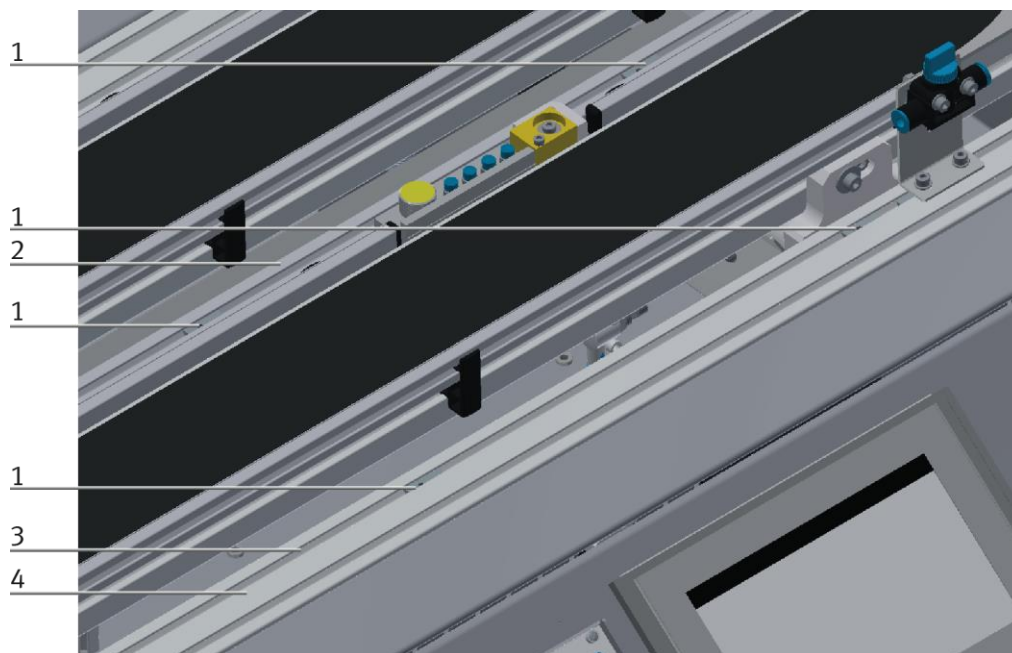
#### **NOTE**

The procedure for installing a CP application module on a basic module is identical for all basic modules. The following example is an example for all basic modules and applications.

#### **Positioning slot nuts in the cross profiles of the CP Factory basic module**

Mounting the CP application module is very easy:

- Two M5-slot nuts (1) have to be put into the inner front slot of the cross profile (4) of the CP Factory basic module.
- Then put two additional M5-slot nuts (1) into the inner back slot of the cross profile (2) of the basic module.
- Then you have to position the slot nuts (1) approximately to the distance of the vertical cross profiles of the CP application module.




Positioning slot nuts / illustration similar

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

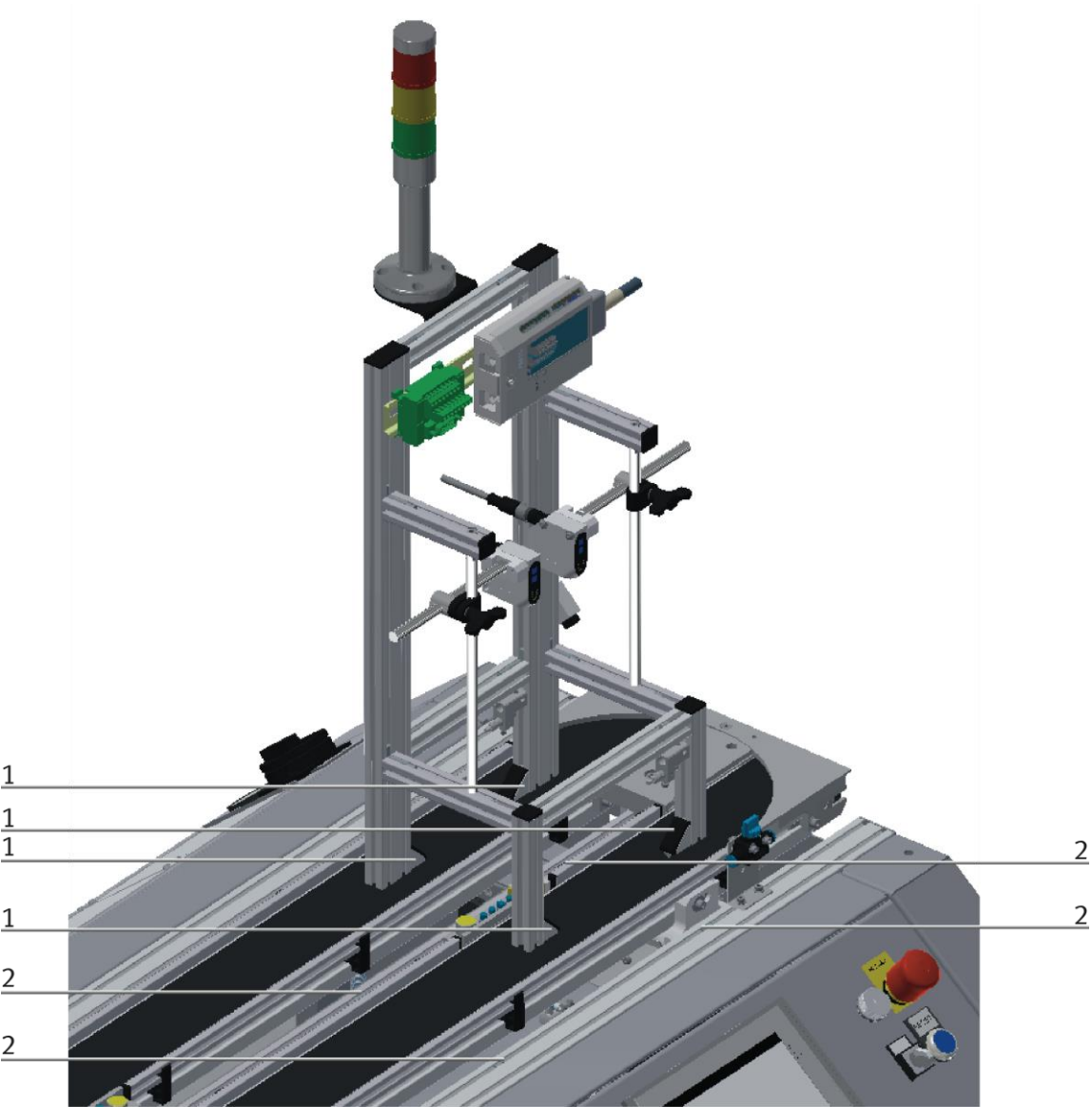
**Attaching the application module to the CP Factory basic module**

- Put the CP application module on the CP Factory basic module.
- 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.

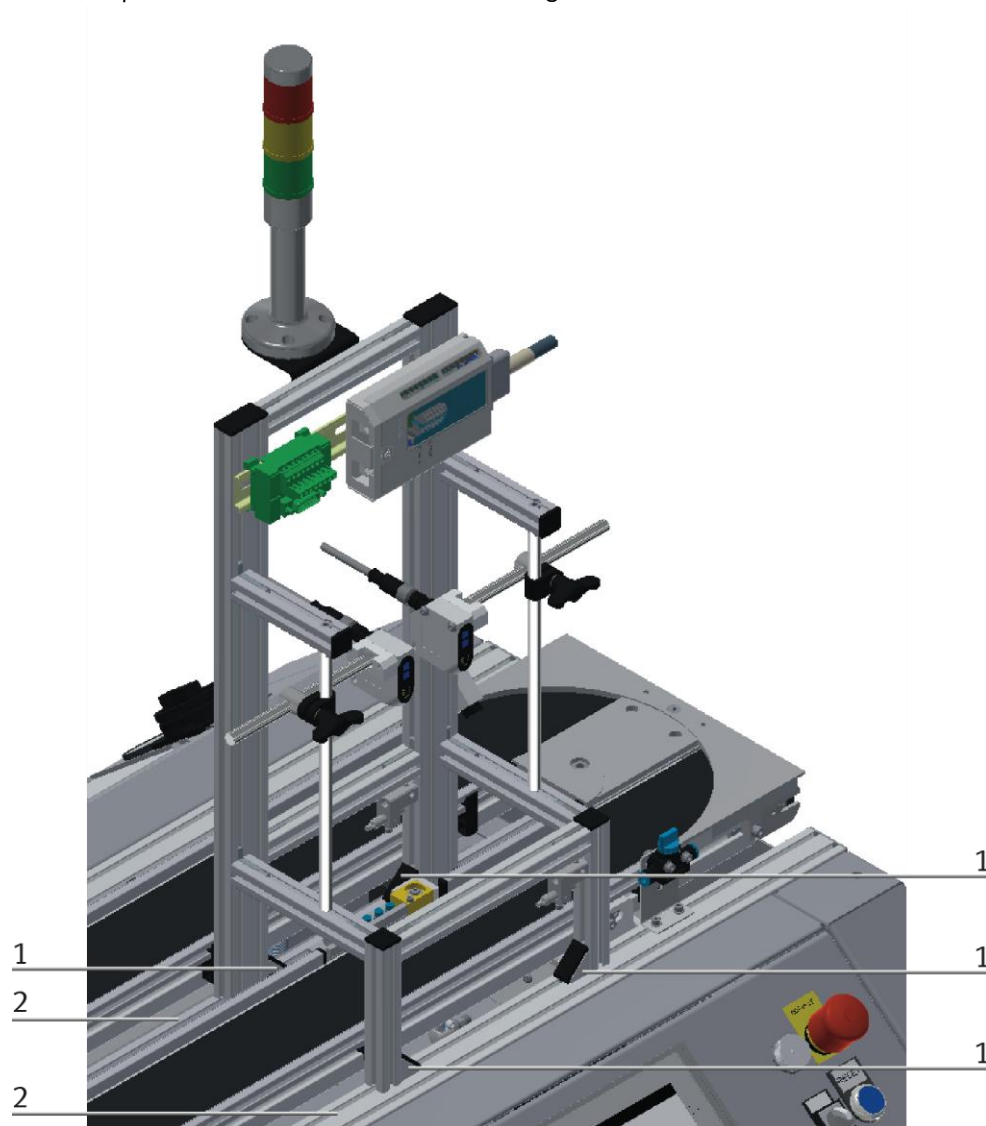


How to put on the CP application module / illustration similar

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

### Adjusting the CP application module and fixing it on the CP Factor basic module

- 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 CP Factory basic module.
- 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	CP Factory basic module: cross profile

### 7.4.5 Connecting the CP application module electrically to the CP Factory basic module

#### SysLink-interface for digital signals

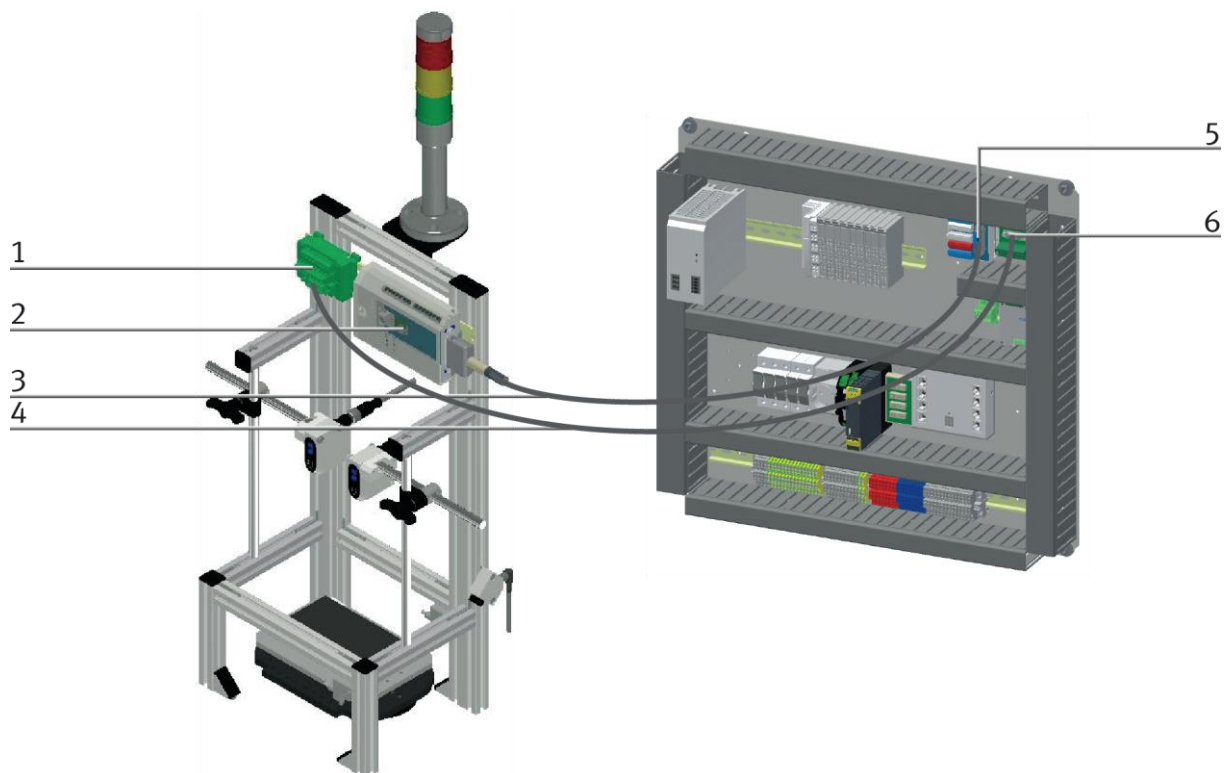
The CP application module exchanges digital input and output signals with the basic module via the SysLink interface:

- Connect the I/O terminal (2) of the CP application module with the I/O terminal (5) on the electric board of the CP Factory basic module. Therefore use the provided connecting cable with SysLink plugs (3).

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

The CP application module produces two analogue output signals with the distance sensors. These are set on the analogue terminal (1) and have to be connected with the analogue inputs of the CP Factory basic module:

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



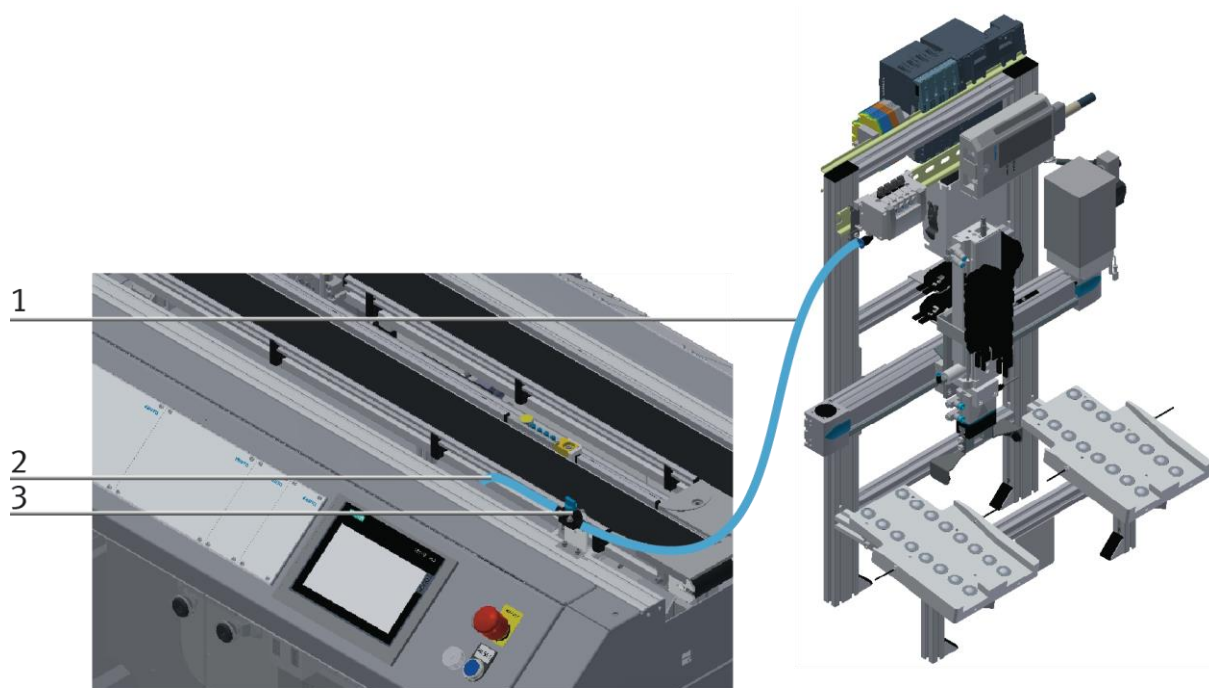
Electrical connections / illustration similar

Position	Description
1	CP application module: analogue terminal (+BG-XD2A)
2	connecting cable with 15-pin D-Sub-plugs
3	CP application module: I/O terminal (+BG-XD1)
4	connecting cable with SysLink-plugs (SysLink-cable)
5	electric board CP Factory basic module: I/O terminal (+K1-XD15)
6	electric board CP Factory basic module: analogue terminal (+K1-XD16A)



#### 7.4.6 Pneumatic connection from 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

7.5 Adjusting the sensors  
7.5.1 Through-beam sensor (Workpiece detection)

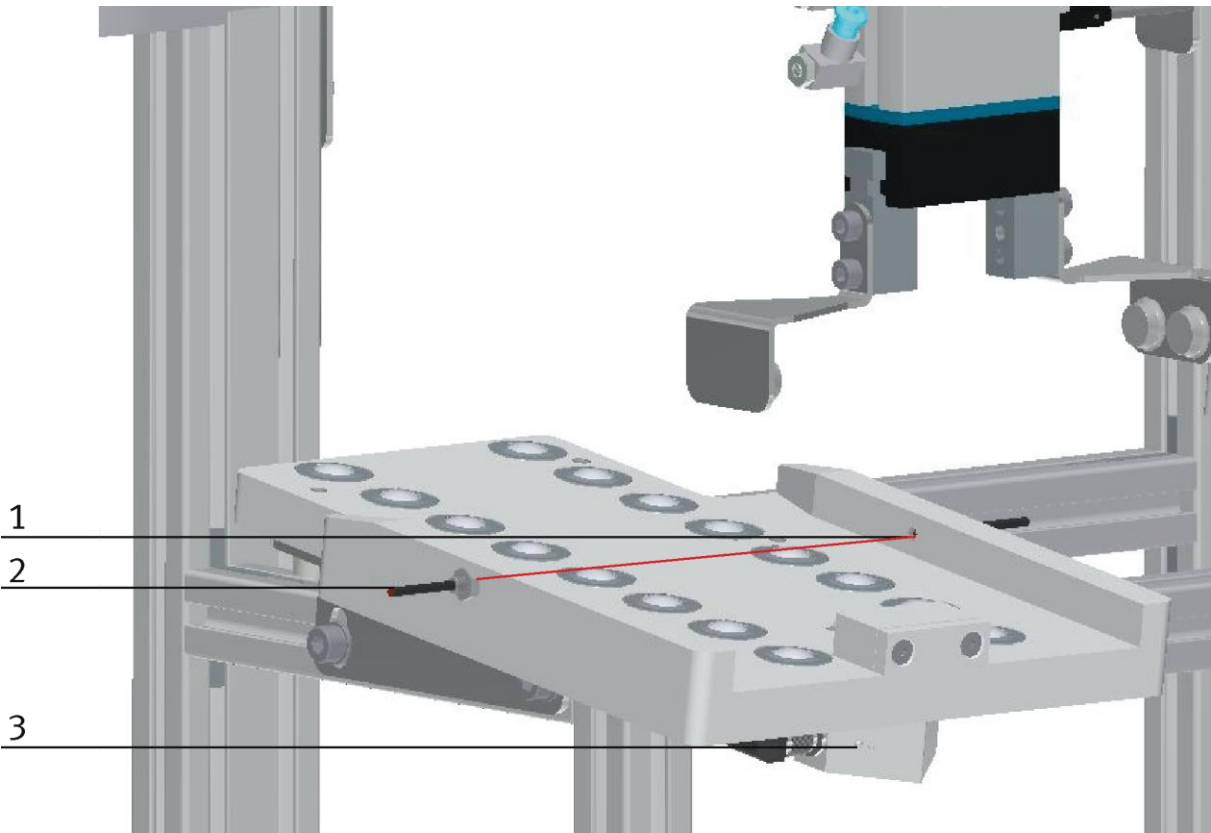


Illustration similar

Position	Designation
1	Sensor socket with sensor and light deflection/ 165360 (SOEZ-LLK-SE-2,0-M4)
2	Sensor socket with sensor and light deflection/ 165360 (SOEZ-LLK-SE-2,0-M4)
3	fibre-optic unit 165327 (SOEG-L-Q30-P-A-S-2L)



The through-beam sensor is used for detecting workpieces. Flexible fibre-optics are connected to a fibre-optic unit. The fibre-optic unit works with visible infrared. The workpiece interrupts the light barrier.

**Requirements**

- Fibre-optic unit has been attached.
- Electrical connection of the fibre-optic unit has been made.
- Power supply is available.

**Procedure**

Please attach the fibre-optic heads towards each other to the application module.

Align the transmitter- and receiver fibre optics.

Attach the fibre-optics to the fibre-optic unit.

You might have to turn the adjusting screw with a small screwdriver until the switching status display (LED) appears.

**Remark**

The maximum permissible number of turns of the adjusting screw is 12.

Please put a workpiece into the sensing range of the light barrier. The switching status display will disappear. You have to do this with all 3 light barriers. Please pay special attention to the corresponding function.

**Documents**

- Data sheets / Operating instructions  
Fibre-optic unit SOEG\_L (165327) and through-beam sensor SOEZ-LLK-SE-2,0-M4 (165360)

### 7.5.2 Proximity Switch (Z-axis)

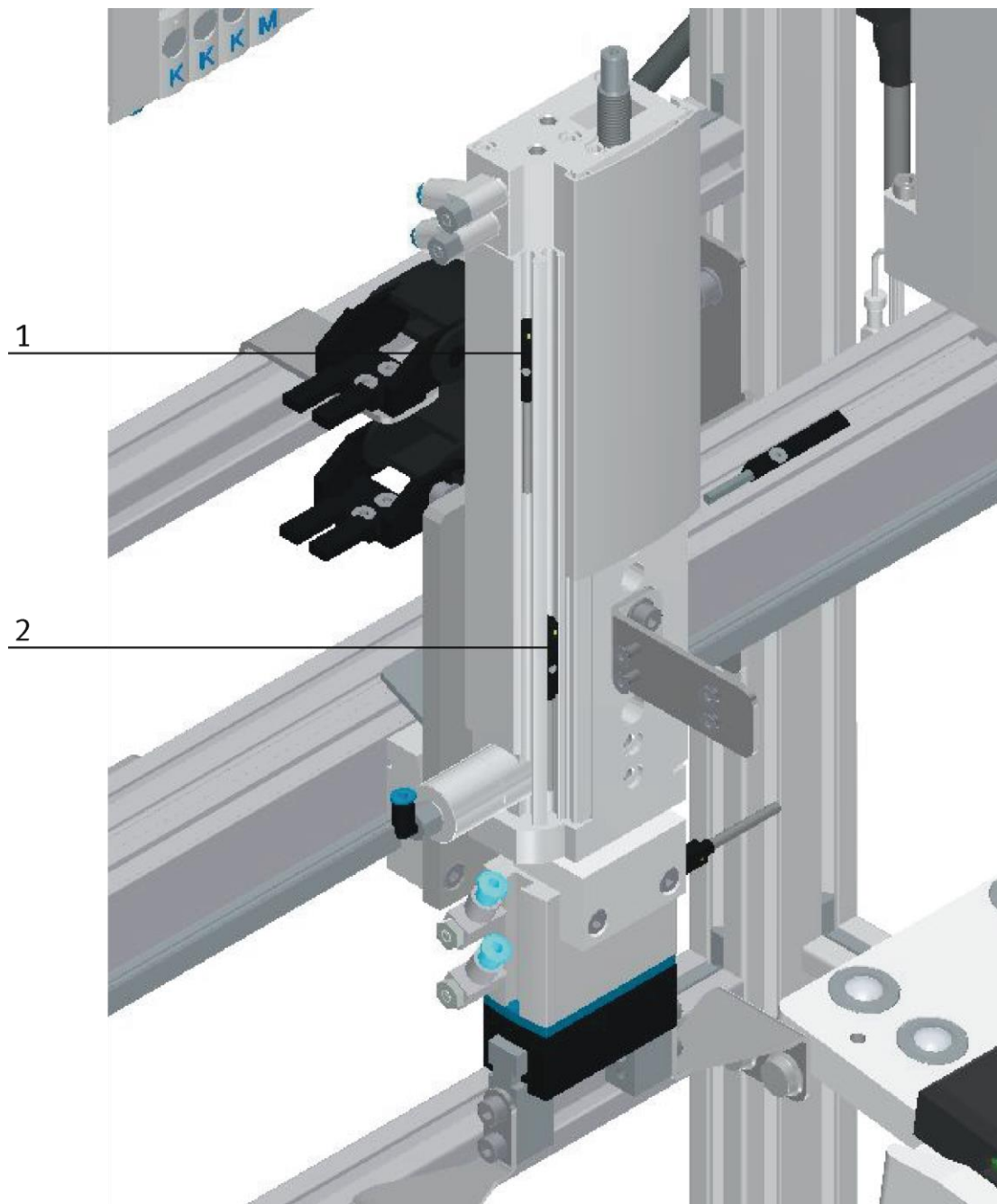


Illustration similar

Position	Designation
1	Z-axis upper position / 551373 (SMT-10M-PS-24V-E-25-L-OE)
2	Z-axis lower position / 551373 (SMT-10M-PS-24V-E-25-L-OE)

The proximity switches are used for checking the end position of the cylinder for the Z-axis. The proximity switches react to a permanent magnet on the piston of the cylinder.

**Requirements**

- Cylinder for Z-axis has been attached.
- Pneumatic port of the cylinder has been made.
- Compressed air supply is switched on.
- Electrical connection of the proximity switches has been made.
- Power supply is available.

**Procedure**

1. The cylinder is in the position to be queried.
2. Move the proximity switch as far as the switching status display (LED) appears.
3. Move the proximity switch into the same direction by a few millimetres as far as the switching status display disappears.
4. Move the proximity switch halfway between the switch on and the switch off position.
5. Tighten the locking screw of the proximity switch with an Allen key SW1.3.
6. Please check the position of the proximity switch by repeated test runs of the cylinder.

**Documents**

- Data sheets / operating instructions  
Proximity switch SMT-10M (551373)

7.5.3 Proximity switch (reference sensor X-axis)

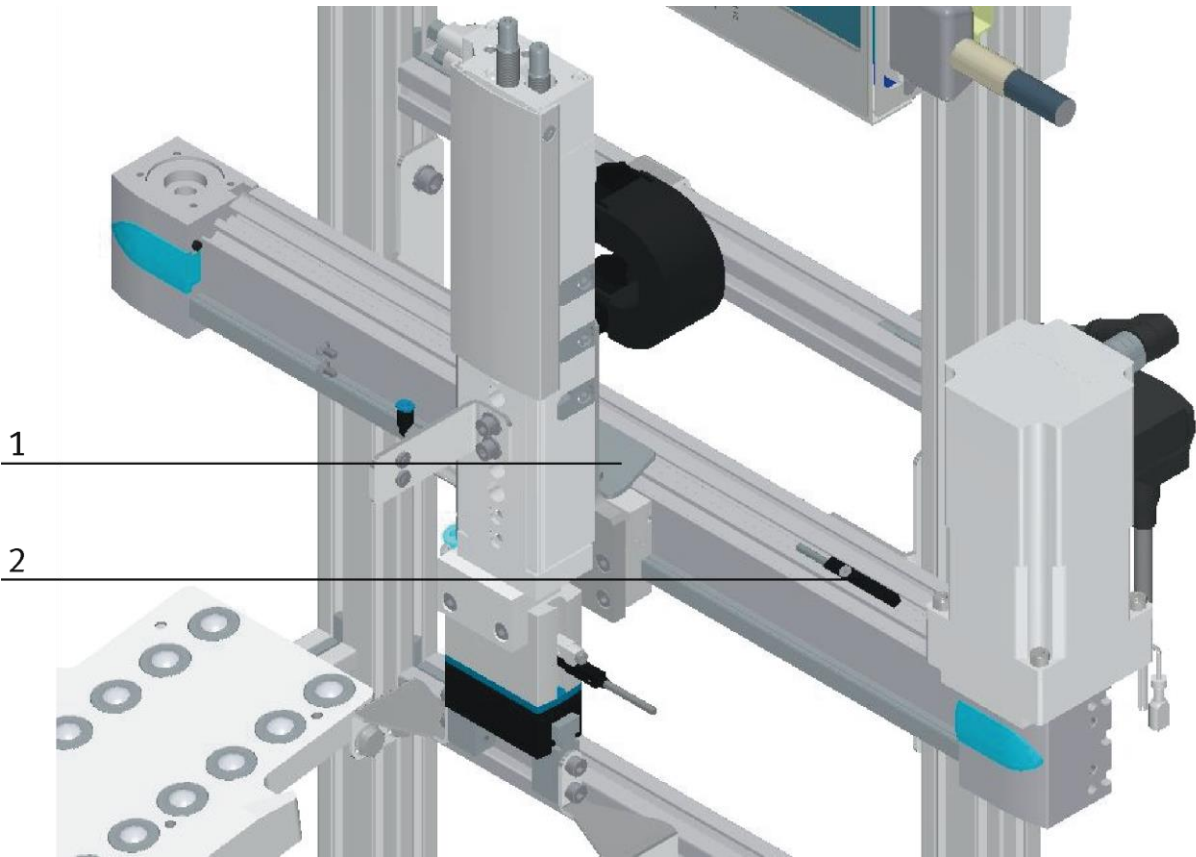


Illustration similar

Position	Designation
1	Switching flag / 558046 (SF-EGC-1-50)
2	Reference sensor X-axis / 551386 (SIES-8M-PS-24V-K-7,5-OE)

The proximity switch is used to refer to the X axis. The proximity switch reacts to the switching flag on the driver of the axle.

**Requirements**

- X-axis has been attached.
- Electrical connection of the proximity switches has been made.
- Power supply unit is switched on.

**Procedure**

1. The axis is in the reference position to be queried.
2. Move the proximity switch as far as the switching status display (LED) appears.
3. Move the proximity switch into the same direction by a few millimetres as far as the switching status display disappears.
4. Move the proximity switch halfway between the switch on and the switch off position.
5. Tighten the locking screw of the proximity switch with an Allen key SW1.3.
6. Please check the position of the proximity switch by repeated test runs of the axis.

**Documents**

- Data sheets / operating instructions  
Proximity switch 551386 / SIES-8M-PS-24V-K-7,5-OE

7.5.4 Proximity Switch (gripper)

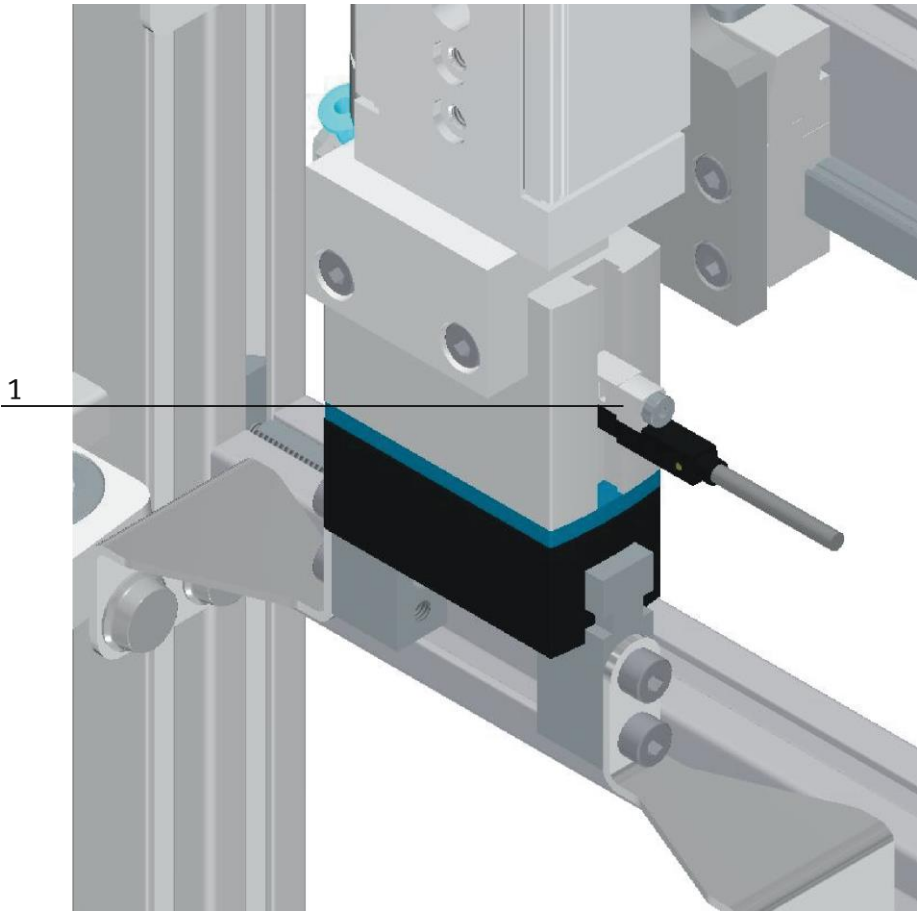


Illustration similar

Position	Designation
1	Sensor gripper opened / 547859 (SMT-8G-PS-24V-E-2,5Q-OE)

The proximity switches are used for checking the end position of the cylinder for the Z-axis. The proximity switches react to a permanent magnet on the piston of the cylinder.

**Requirements**

- Gripper is mounted
- Pneumatic port of the gripper has been made.
- Compressed air supply is switched on.
- Electrical connection of the proximity switches has been made.
- Power supply is available.

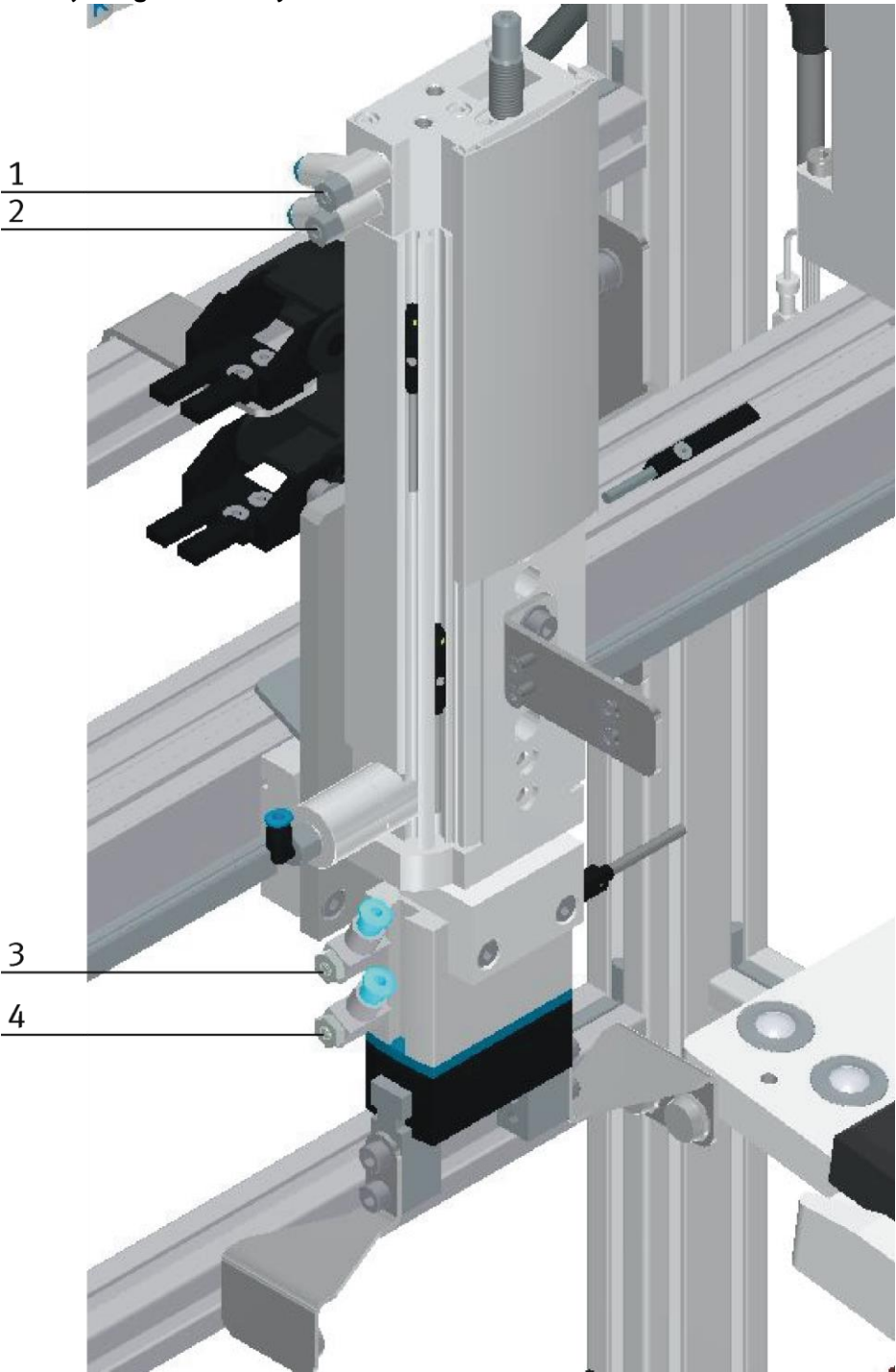
**Procedure**

1. The gripper is in the position to be queried.
2. Move the proximity switch as far as the switching status display (LED) appears.
3. Move the proximity switch into the same direction by a few millimetres as far as the switching status display disappears.
4. Move the proximity switch halfway between the switch on and the switch off position.
5. Tighten the locking screw of the proximity switch with an Allen key SW1.3.
6. Please check the position of the proximity switch by repeated test runs of the gripper.

**Documents**

- Data sheets / operating instructions  
Proximity switch 547859 / SMT-8G-PS-24V-E-2,5Q-OE

7.6 Adjusting the one-way flow control valves



One way flow control valves / illustration similar

Position	Designation
1	One-way flow control valves GRLA for Z-axis cylinder
2	One-way flow control valve GRLA for Z-axis cylinder
3	One-way flow control valves GRLA for gripper
4	One-way flow control valves GRLA for gripper



One-way flow control valves are used for regulating the exhaust air volume of double-acting drive units. In the opposite direction, the air flows through the flow control valve having a full cross-sectional flow. The piston is clamped between air cushions by free supply air and throttled exhaust air (improvement of the operating behaviour even if the load changes).

**Requirements**

- Pneumatic port of the cylinders has been made.
- Compressed air supply is switched on.

**Procedure**

1. At first, turn off the two one-way control valves completely. Then turn them on again by about one rotation.
2. Start a test run.
3. Turn on the one-way flow control valves slowly until the required piston speed has been reached.

**Documents**

- Data sheets  
One-way flow control valve (193138)

## 8 Operation

Any customer can use the application module at his own discretion. Since the application modules do not have any control elements, this is done with the respective basic modules installed.

If the application module is mounted on a CP Lab transport system or on a CP Factory basic module, the general operation is described in these manuals. All application-specific information is described in the application module manual.

The general operating parameters must be adhered to.

### 8.1 General operating instructions

The operation requires some regulations which have to be observed strictly. If you don't observe the rules, there might occur faults in the process. Dangers to your physical health can also not be excluded.

It is strongly recommended to stick to the following rules.

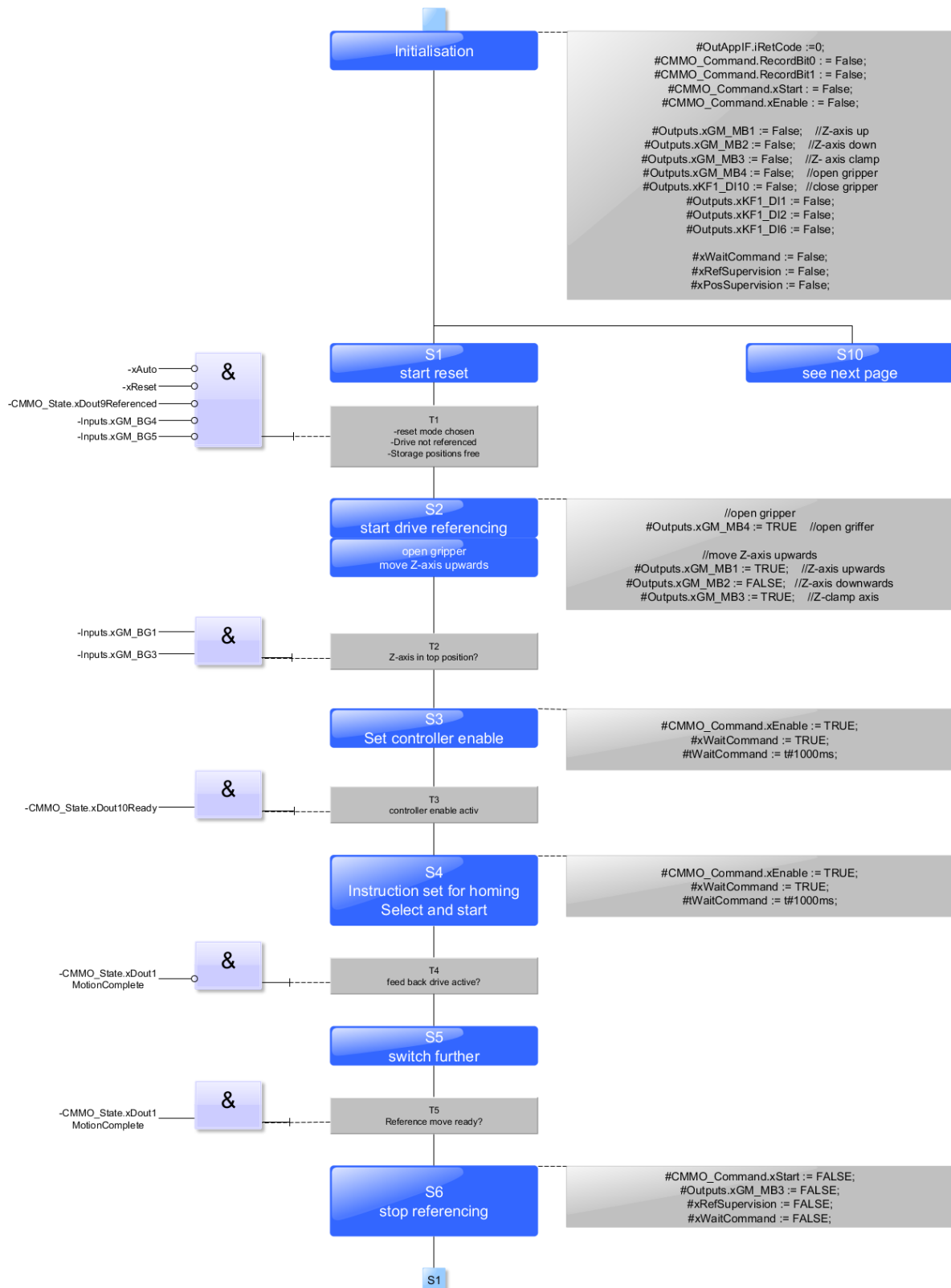
#### 8.1.1 Conduct instructions

- During operation it is not allowed to interfere manually.
- With bigger groups it is necessary to install a mechanic barrier.
- You mustn't take off any cable connections on voltage.
- Water of any kind has to be kept away.

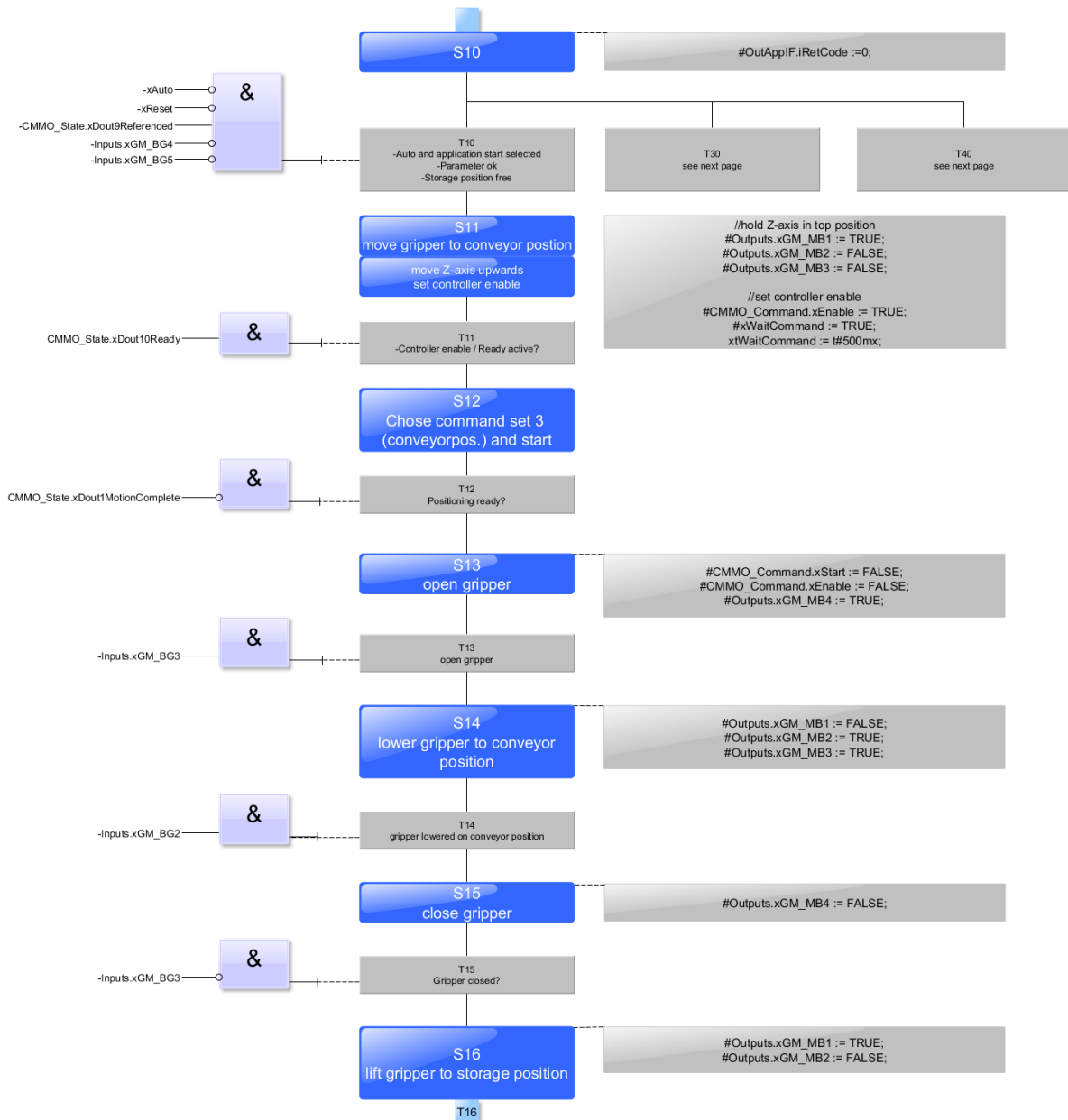
#### 8.1.2 Operating instructions

- The basic modules may only be operated by authorized and instructed persons.
- Operation has to be effected according to the user manual.
- Any uncontrolled pressing on different switches/pushbuttons of all control units has to be prevented.

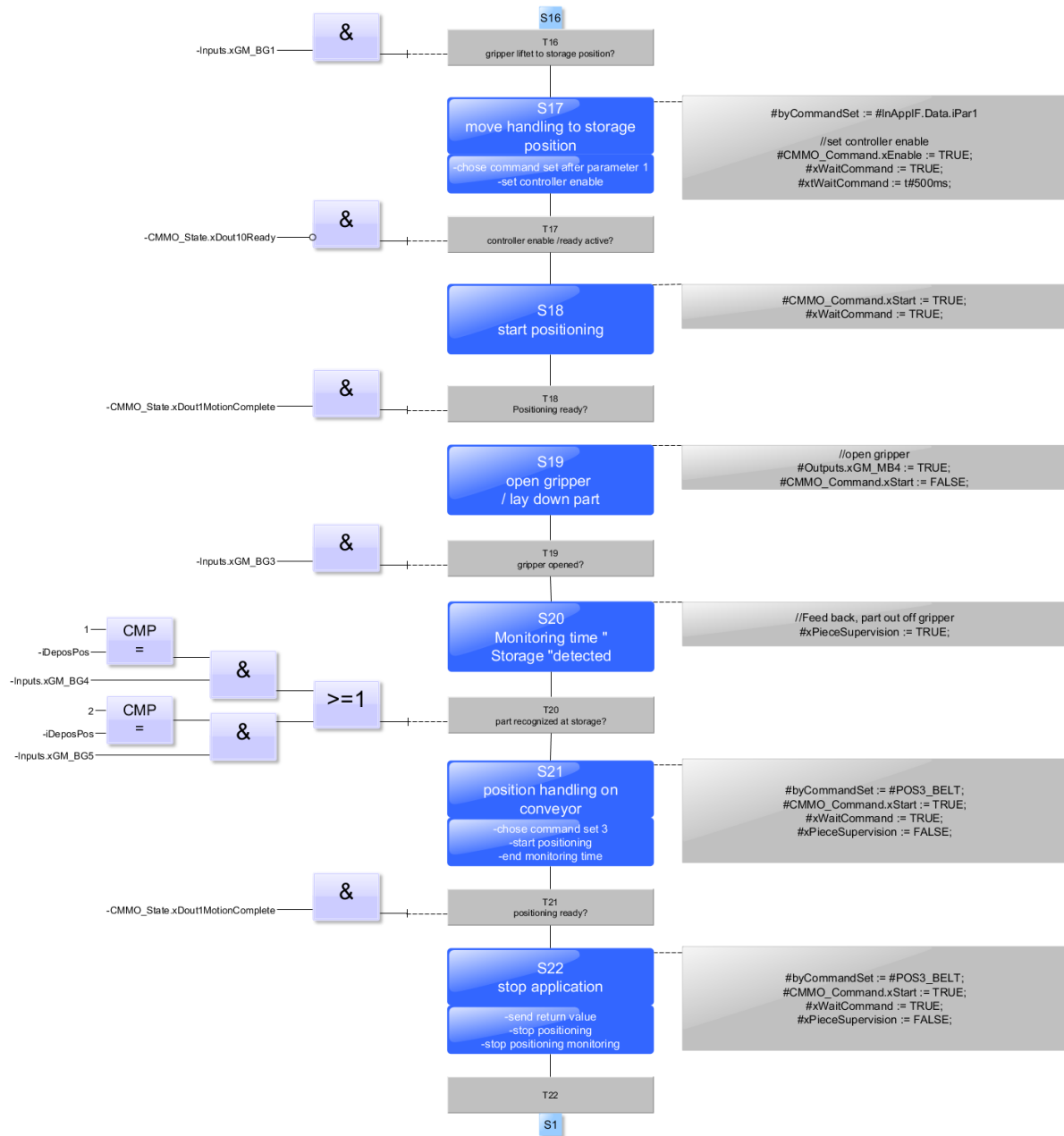
## 8.2 Sequence description of the application module output



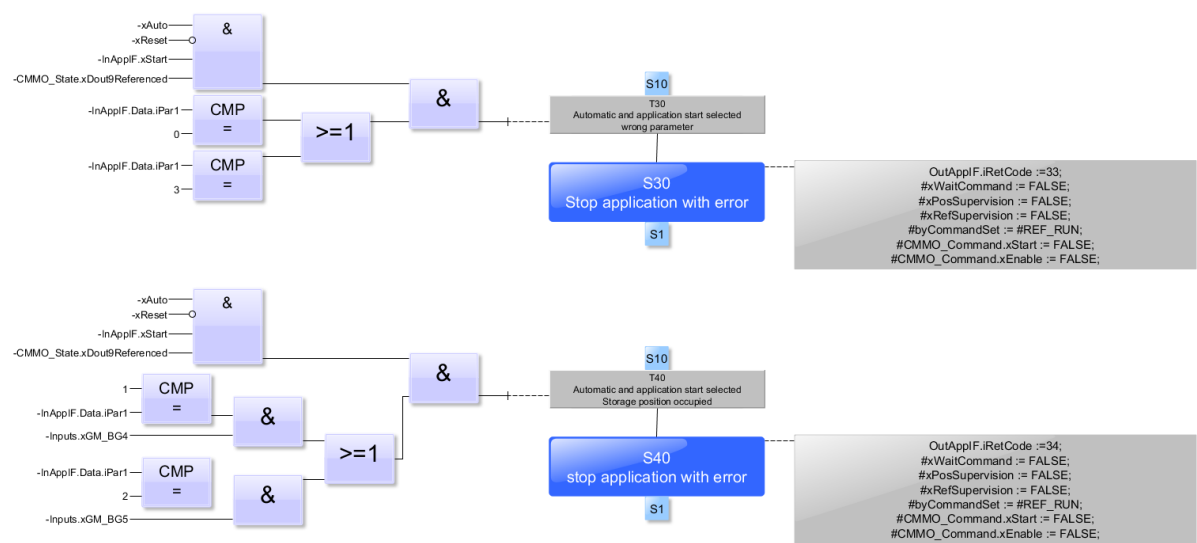
Adjusting sequence



Automatic Mode sequence step 1



Automatic Mode sequence step 2

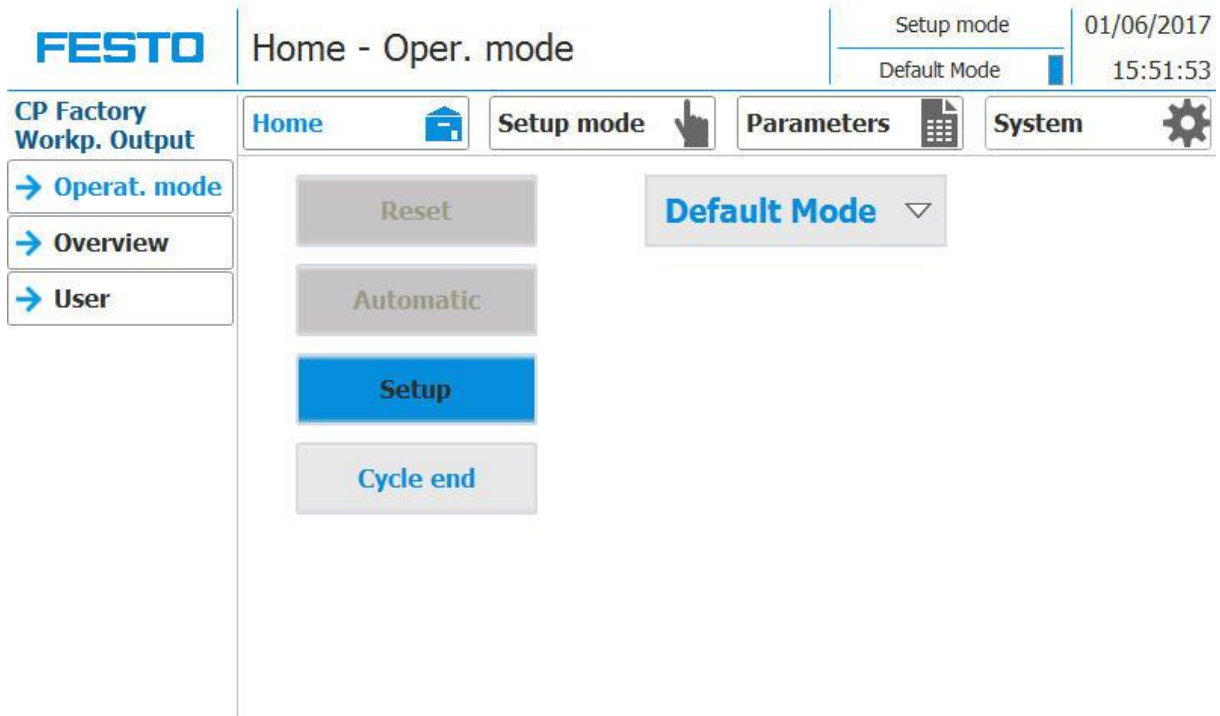


Sequence decription with error

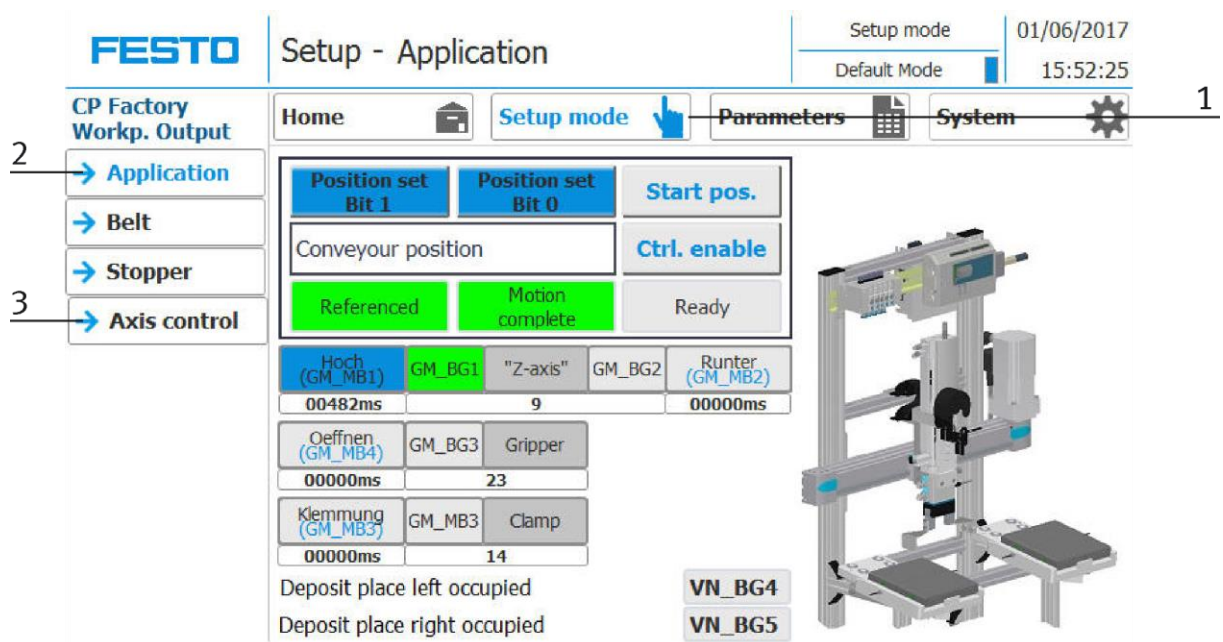
### 8.3 Setting the application module output at HMI

To set the application module, the application module must be set to setup mode.

1. On the Start screen, click Setup



Change to the setup page (1) and select the application (2). Use the button axis control (3) to display the values of the axis.



2. Application is selected to set up the application module

**FESTO** Setup - Application

Setup mode 01/06/2017  
Default Mode 15:52:25

CP Factory Workp. Output

Home Setup mode Parameters System

→ Application  
→ Belt  
→ Stopper  
→ Axis control

1  
2  
3  
4  
5

Position set Bit 1 Position set Bit 0 Start pos.  
Conveyour position Ctrl. enable  
Referenced Motion complete Ready


Hoch (GM\_MB1) GM\_BG1 "Z-axis" GM\_BG2 Runter (GM\_MB2)  
00482ms 9 00000ms

Oeffnen (GM\_MB4) GM\_BG3 Gripper  
00000ms 23

Klemmung (GM\_MB3) GM\_MB3 Clamp  
00000ms 14

Deposit place left occupied  
Deposit place right occupied

VN\_BG4  
VN\_BG5



Position number	Description
1	<p>Move to position</p> <p>Position set Bit 1: Move to storage position 2 right (lights up blue if preselected)</p> <p>Position set Bit 0: Move to storage position 1 left (lights up blue if preselected)</p> <p>Position set Bit 0 and Bit1: Move to the conveyor position (both light up blue if preselected)</p> <p>Start pos.: move to the selected position (controller enable must be enabled / lit blue when active)</p> <p>Control enable: the controllers are enabled and a move to one of the preselected positions is possible (lights up blue when active)</p> <p>Referenced: lights up green when reference move is done</p> <p>Motion complete: lights up green when desired position has been approached</p> <p>Ready: lights up green when controller enable is issued and handling is ready</p>
2	<p>Z axis</p> <p>Hoch: move Z axis up (actuator GN_MB1 is activated, lights up blue when active)</p> <p>GM_BG1: Sensor GM_BG1 Display (lights up green when Z axis is up)</p> <p>Z-Axis: Z axis display</p> <p>GM_BG2: Sensor GM_BG2 Display (lights up green when Z axis is down)</p> <p>Down: Move the Z axis down (actuator GN_MB2 is activated, lights up blue when active)</p>
3	<p>Open the gripper</p> <p>Oeffnen: Open gripper (actuator GN_MB4 is activated, lights up blue when active)</p> <p>GM_BG3: Sensor GM_BG3 Display (lights up green when gripper is opened)</p> <p>Gripper: Display gripper</p>
4	<p>Open the clamp</p> <p>Klemmung: Open the clamping unit (actuator GN_MB3 is activated, lights up blue when active)</p> <p>GM_MB3: Indicator (lights up green when clamp is open)</p> <p>Clamp: Display Clamp</p>
5	<p>Deposit place left occupied: Sensor VN_BG4 Display (lights up green when storage space is occupied)</p> <p>Deposit place right occupied: Sensor VN_BG5 Display (lights up green when storage space is occupied)</p>



3. Select the axis controller; here all current values of the axis controller are displayed.

## Setup - axis control

Setup mode
01/06/2017

Default Mode
15:52:55

**CP Factory Workp. Output**

- Application
- Belt
- Stopper
- **Axis control**

Home 
**Setup mode** 
Parameters 
System

### SVE communication

Connection	
Transmit counter	13270
Step	10

### Received values

Acknowledge byte	0
Nominal position	164960
Error number	0000

### Received state word

Bit 31
0

00000000000000000000101000010001100000

Bit 24 :	Bit 16 :	Bit 8 : Move	Bit 0 : Ready to switch on
Bit 25 :	Bit 17 :	Bit 9 :	Bit 1 : Switched on
Bit 26 :	Bit 18 :	Bit 10 : Motion complete	Bit 2 : Operation enabled
Bit 27 :	Bit 19 :	Bit 11 :	Bit 3 : Error
Bit 28 :	Bit 20 :	Bit 12 : Setpoint acknowledge	Bit 4 :
Bit 29 :	Bit 21 :	Bit 13 :	Bit 5 : /Quick Stop
Bit 30 : Direction pos. blocked	Bit 22 :	Bit 14 :	Bit 6 : Switch on disabled
Bit 31 : Direction neg. blocked	Bit 23 :	Bit 14 :	Bit 7 : Warning

### 8.4 Transitions of the application module

The transitions are located in the Parameters submenu

Parameters - Transitions

Setup mode 01/06/2017

Default Mode 15:53:14

CP Factory  
Workp. Output

→ Application

→ Transitions

→ Conveyor

Home

Setup mode

Parameters

System

No.	Start condition	Application execute		Deposit place	Parameter ---	End condition
Init	none			0	0	1
1	1		✓	2	0	2
2	2		✓	1	0	1
3	0			0	0	0
4	0			0	0	0
5	0			0	0	0
6	0			0	0	0
7	0			0	0	0
8	0			0	0	0
9	0			0	0	0
10	0			0	0	0

The transitions can be displayed or changed here. The transitions are used in the default mode, see also the following chapter.

66

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### 8.4.1 Parameter (OUT)

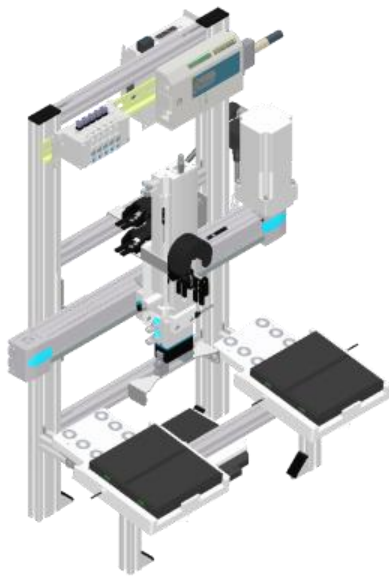


Illustration similar

Default:

Parameter-No.	Description
1	<b>Slide for output</b> 1: slide left (line of sight to front view from CP Lab conveyor, CP Factory basic module) 2: slide right (line of sight to front view from CP Lab conveyor, CP Factory basic module) Limitation: No limit to the value in the transition table
2	Not used
3	Not used
4	Not used

MES:

Operation		Parameter	Description
205	Deliver part	1	<b>slide (0=anywhere, 1=left, 2=right)</b> Low Limit: 0 High Limit:-2 Value: 0 Type: changeable
		2	<b>Buffer number</b> Value: 0 Type: constant
		3	<b>Resource number</b> Value: 0 Type: constant

## 9 Error messages and message texts 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 paler is automatically acknowledged
- Note
  - Displayed on the HMI but not processed in MES

## 9.1 Reporting texts

### 9.1.1 General remediation texts

The "XXX" values are variables and change depending on the application. These texts can occur on all applications and modules.

Report class	Location	Alarm name	Report text	Fix error
0	ActMon_1M0B	prgSysAlarmActv	Time monitoring "XXX" Activation actuator:: "XXX" / PLC: "XXX" / instance: "XXX"	Check the actuation of the actuator
0	ActMon_1M0B_noHold	prgSysAlarmActv	Time monitoring "XXX" Activation actuator:: "XXX" / PLC: "XXX" / instance: "XXX"	Check the actuation of the actuator
0	ActMon_1M1B	prgSysAlarmExtd	No feedback of the sensor "XXX" on trigger of the activation actuator:: "XXX" / PLC: "XXX" / instance: "XXX" /	Check control / feedback!
0	ActMon_1M1B	prgSysAlarmRtrd	Feedback from sensor "XXX" without control of the actuator "XXX" PLC: <field ref = "0" />; Instance: "XXX"	Check control / feedback!
0	HeatMon	prgSysAlarmActv	Time monitoring heating. Setpoint not reached. PLC: "XXX" / instance: "XXX"	Check temperature sensor Heating not enabled by the selector switch Heating resistors defective
0	CylMon_1M1B	prgSysAlarmExtd	Time monitoring movement of the cylinder. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check the air pressure Check the limit switch / setting Check traverse path (exiting)
0	CylMon_1M1B	prgSysAlarmRtrd	Time monitoring movement of the cylinder. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check the air pressure Check the limit switch / setting Check traverse path (retraction)
0	CylMon_2M1B	prgSysAlarmExtd	Time monitoring movement of the cylinder. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check the air pressure Check the limit switch / setting Check travers path (exiting)
0	CylMon_2M1B	prgSysAlarmRtrd	Time monitoring Reset movement of the cylinder. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check the air pressure Check the limit switch / setting Check traverse path (retraction)

Report class	Location	Alarm name	Report text	Fix error
0	CylMon_2M1B	prgSysAlarmSens	Time monitoring divergence cylinder sensors. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check the air pressure Check the limit switch / setting Check traverse path
0	CylMon_2M2B	prgSysAlarmExtd	Time monitoring movement of the cylinder. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check the air pressure Check the limit switch / setting Check traverse path (exiting)
0	CylMon_2M2B	prgSysAlarmRtrd	Time monitoring Reset movement of the cylinder. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check the air pressure Check the limit switch / setting Check traverse path (retraction)
0	CylMon_2M2B	prgSysAlarmSens	Time monitoring divergence cylinder sensors. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check the air pressure Check the limit switch / setting Check traverse path
0	DriveMon_4Q	prgSysAlarmA	Time monitoring: Motor clockwise (rapid) defective. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check transducer disk / sensor motor Check the motor cable
0	DriveMon_4Q	prgSysAlarmB	Time monitoring: Motor left run (rapid traverse) defective. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check transducer disk / sensor motor Check the motor cable
0	DriveMon_4Q	prgSysAlarmC	Time monitoring: Motor clockwise (slow speed) defective. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check transducer disk / sensor motor Check the motor cable
0	DriveMon_4Q	prgSysAlarmD	Time monitoring: Motor left run (slow speed) defective. Initiator: "XXX" / PLC: "XXX" / instance: "XXX"	Check transducer disk / sensor motor Check the motor cable

Report class	Location	Alarm name	Report text	Fix error
0	Error	ErrNotAus	EMERGENCY STOP is actuated!	Check emergency stop button - F2-FQ1 and confirm with button -F2-SF1.
2	Error	WarnMES4	Communication to MES4 interrupted!	Please check connection
0	Error	ErrAppTimeout	Application Timeout!	
0	Error	PnErrKF80	PROFINET Connection to subscriber "+ K2-KF80" is interrupted	
0	Error	PnErrKF81	PROFINET Connection to subscriber "+ K2-KF81" is interrupted	
0	Error	ErrProgramm	Programming errors! OB121 was called.	Check program
2	Error	WarnRfidTout	RFID time monitoring is active!	Please check the RFID sensor and the chip.
2	Error	WarnRfidErr	RFID writing / reading with error ended!	Please check the RFID sensor and the chip.
2	Error	WarnConvStop	Conveyor start / stop by sensors Energy saving mode: conveyor is stopped!	Place the workpiece carrier at the beginning of the conveyor Waiting until a workpiece carrier comes automatically from predecessor station

### 9.1.2 RFID detection messages

Report class	Location	Alarm name	Report text	Fix error
0	RFID_Control	fbErrRfidTout	Timeout at RFID writing / reading to RFID- Instance: "Calling function block!"	Check workpiece carrier / RFID Chip
0	RFID_Control	fbErrRfidErr	Error at RFID writing / reading to RFID- Instance: "Calling function block!"	Check workpiece carrier / RFID Chip
0	Stopper_Default	fbErrCarrier	No RFID tag identified at RFID- Instance: "Calling function block!"	Check workpiece carrier / RFID Chip
0	Stopper_Mes	fbErrCarrier	No RFID tag identified at RFID- Instance: "Calling function block!"	Check workpiece carrier / RFID Chip

### 9.1.3 Message texts of the application module output

Report class	Location	Alarm name	Report text	Fix error
0	ErrorApp	ErrRefRun	Referencing not possible, storage position occupied; Initiator „XXX“ / „XXX“; PLC: field ref= "0"	Please remove workpiece(s)!
2	ErrorApp	WarnSlide1	Storage position 1 (left) occupied; Initiator „XXX“; PLC: <field ref= "0"	Please remove workpiece(s)!
0	ErrorApp	ErrTimeoutPos	Time out at movement monitoring X-axis; PLC: <field ref= "0" />; Instanz: <field ref= "1"	Please remove workpiece(s)!
2	ErrorApp	WarnSlide2	Storage position 2 (right) occupied; Initiator „XXX“; PLC: <field ref= "0" />;	Please remove workpiece(s)!
0	ErrorApp	ErrCtrlRel	No feedback "ready" when regulator release at x-axis; PLC: <field ref= "0"	Please check releases and be sure that the Z-axis is in upper position.

### 9.2 Interactive message texts

Interactive messages are displayed via a pop-up window. Pop Up has two buttons

Retry - Try to redo the action

Abort - The action is aborted and directed to the Cell Controller. There can also be a retry executed or cancelled. In this case, the order would be stored with errors in MES.

#### 9.2.1 General

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

#### 9.2.2 Application module output

Value	Text	Fix error
1070	Referencing did not finish!	Start referencing again
1071	Positioning did not finish!	Start positioning again
1072	No part on deposit slide detected after output!	Check sensors BG4/BG5.
1073	Wrong parameter for deposit position!	Check parameter
1074	Start not possible, deposit position is occupied!	Remove part from slide



## **10 Spare part list**

- Key 8027302
- 24V cable 381525

## 11 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.


## 12 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](http://www.ip.festo-didactic.com)



## 13 Disposal

	<p><b><i>NOTE</i></b></p> <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>
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