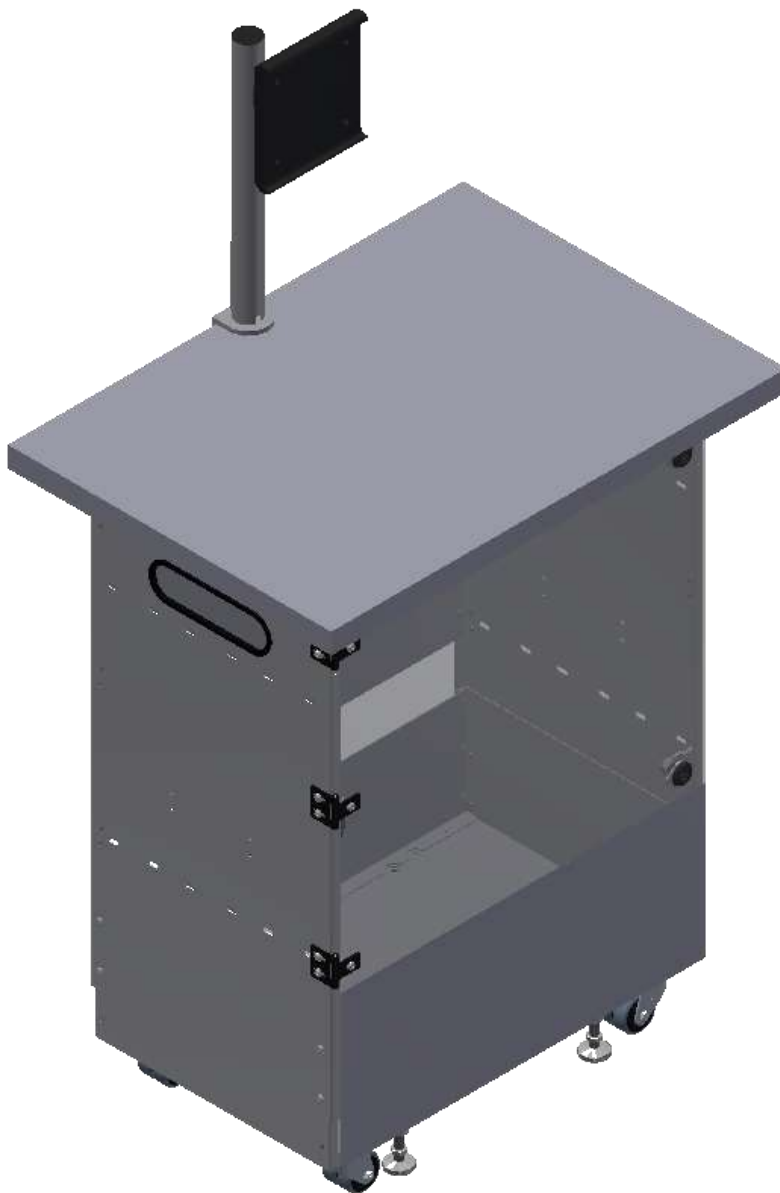


MBUF

FESTO

CP Factory/CP Lab

Original operating
instructions



Festo Didactic
en
03/2022

Order number:
Revision Level: 03/2022
Authors: Schober, Weiss
Layout: Frank Ebel
File Name: CP-F-MBUF-GB-A005.doc

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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.

	 CAUTION
	<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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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.

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

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

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

	NOTE
	<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.



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 ≤ 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.

	 WARNING
	<ul style="list-style-type: none">• Malfunctions which could impair safety must be eliminated immediately!

	 CAUTION
	<ul 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.

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 Electrical components

	 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 transportSwitch off the power supply immediately.• Protect the device to prevent it from being restarted accidentally.

4.3 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.



4.4 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.

4.5 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.



	<p data-bbox="756 792 1027 853" style="text-align: center;"> WARNING</p> <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.
---	---


4.6 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.

4.7 Transport

	 WARNING
	<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.

	NOTE
	<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.

4.8 Name plates



Name plate example

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

4.9 CE Declaration of Conformity

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(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 fabrikanterens ansvar. Genstanden for erklæringen, som beskrives, er i overensstemmelse med den relevante EU-harmoniseringslovgivning.

(EL) Η παρούσα δήλωση συμμόρφωσης εκδίδεται με αποκλειστική ευθύνη του κατασκευαστή. Ο περιγραφόμενος αντικείμενο της δήλωσης είναι σύμφωνα με τη σχετική νομοθεσία αρμόδια της Ένωσης.

(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 ainuvastutuseel. Kirjeldataud deklareeritav toode on kooskõlas asjaomaste liidu ühtlustamisaktidega.

(FI) Tämä vaatimustenmukaisuusvakuutus on annettu valmistajan yksinomaisella vastuulla. Käytetty vakuutuskeskitys on asiaa koskevan unionin yhdenmukaistamisäätöjä noudatta 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 adja ki. Az ismertetett nyilatkozat tárgya megfelel a vonatkozó uniós harmonizációs 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 objektas 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 prawaodawstwa 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 ledajo te izjavo o skladnosti je odgovoren izključno proizvajalec. Opisani predmet izjave je v skladu z ustreznimi zakonodajno 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 sorumluluğu altındadır. Belgede açıklanan obje, Birliğin ilgili uyum mevzuatına uygundur.

EG-Konformitätserklärung
 EU Declaration of Conformity
 Δήλωση συμμόρφωσης ΕΚ
 Prohlášení o shodě ES
 EF-overensstemmelseserklæring
 Δήλωση 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-erklæring van
 overeenstemming
 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.

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8101137 – DoC0039

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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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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 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 - X11	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 61004-1	2018
ETSI EN 301 489-3	V2.1.1	EN IEC 61004-2	2018
EN 50119 - A1 - A11	2016/02/17/2023	EN 61004-3 - A1	2007/2011
EN 50302 - A11 Class A/B	2015/02/26	EN IEC 61004-4	2018
EN 50303 - A11	2011/03/25	EN IEC 61004-5	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) Delegierte Rechtsakte für Funkanlagen / Delegated acts for Radio equipment



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

4.10 General product safety

	 WARNING
	<ul style="list-style-type: none"> • General product safety, CE conformity <ul style="list-style-type: none"> – The product fulfills the requirements of all applicable EU directives. We confirm this with the CE mark. – 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.

4.11 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.

4.11.1 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.



4.11.2 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 Design and Function

5.1 Transport

	 WARNING
	<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 forklift 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.

	 WARNING
	<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.

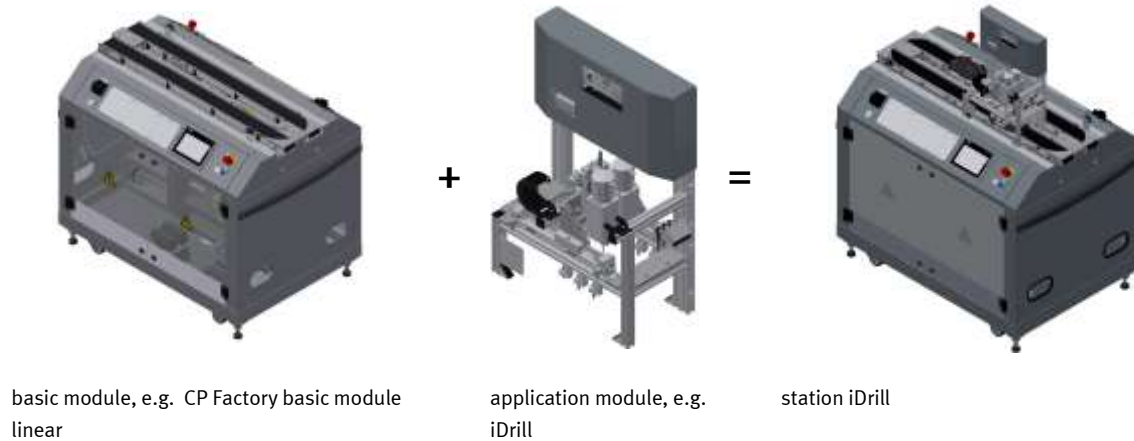
	 WARNING
	<ul style="list-style-type: none"> • Danger of crushing for hands/feet <ul style="list-style-type: none"> – It is not permitted to grip onto or under the feet when handling the machine, as there is an increased risk of hands or feet getting crushed or trapped in these areas. – When setting down the station, make sure no persons have their feet under the machine's feet.

NOTE	
	<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.

5.2 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 iDrilling 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 car. The workpiece consists of a chassis, of two axles with wheels, and a chassis in 3 colours.



5.3 Workstations in the CP System

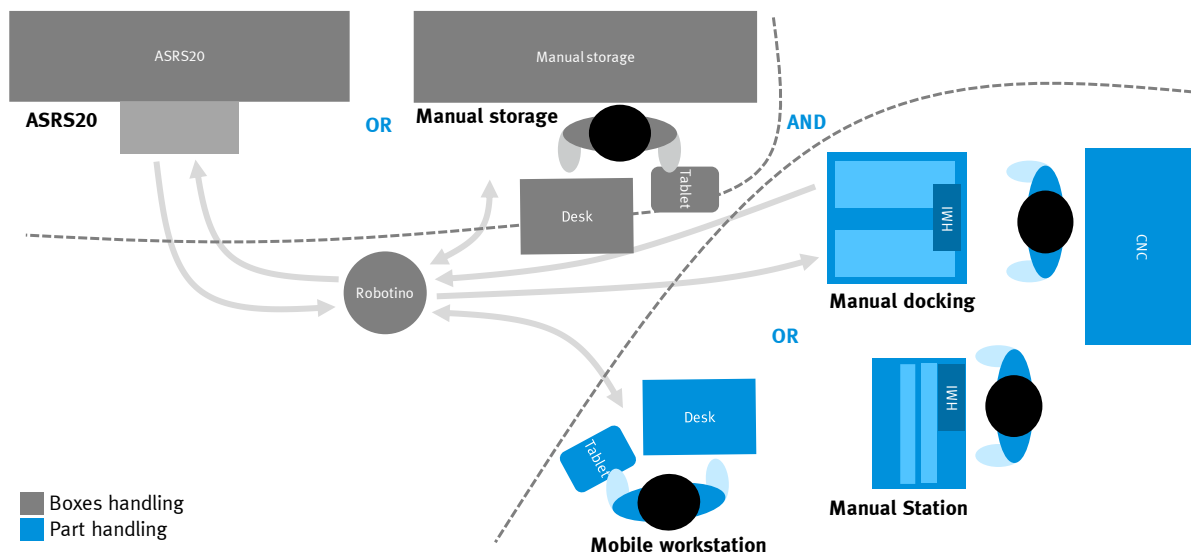
The following manual serves as an example, it might be differed to your system in some points, for example the workpieces or resources.

Manual webpages are used to instruct the operators at the following resources:

TypeNo	Resource Type	Template	Instructions for	Screen
1	Manual Docking	CP-F-BUF-B	Parts in boxes	HMI
2	Mobile Workstation	CP-F-MAN-Mobile	Parts on Carriers/Boxes	iPad
3	Manual Storage	CP-F-MSRS20-B	Boxes	iPad
4	Manual Station	CP-AM-MAN	Parts on carriers	HMI


While the Manuals Storage deals with the whole boxes, like the automated storage ASRS20, the Manual docking, the Mobile Workstation and the Manual Station give instructions how to change the content, i.e. the workpieces.

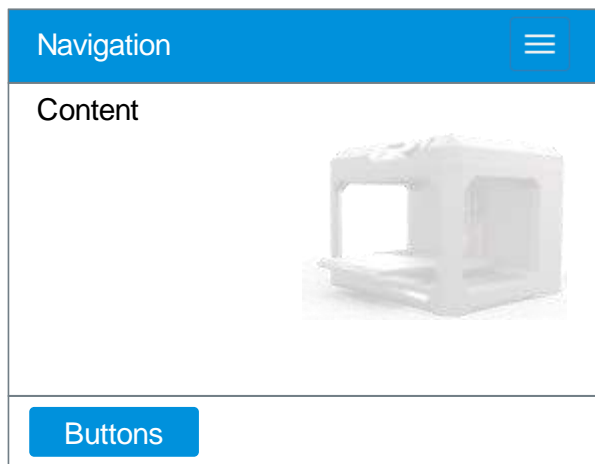
In this document, the webpages for Mobile Workstations are regarded.



5.4 Calling webpages

5.4.1 Tablet (iPad)

	<p style="text-align: right; margin: 0;">NOTE</p> <p>The task is shown, if the current step of the workplan of an order position is assigned to the workstation resource. Otherwise, the “No task” page is shown.</p>
---	--




Navigation:


MES4 Mobile → Production Control → Workstations → [select resource]

Direct link e.g.

<http://172.21.0.90/i4.0/mes4/EN/mes4.php?content=production&subcontent=workstations&resourceID=10>

5.4.2 HMI with control buttons on the webpage


	NOTE
	<p>The webpage is called from the HMI in a web browser frame. If the current order position is assigned to the calling resource, the task is shown. Otherwise, the “No Task” page is displayed.</p>

<p>Content</p> <div style="text-align: center;"></div>
Buttons

Direct link e.g.

<http://172.21.0.90/i4.0/mes4/EN/mes4.php?content=production&subcontent=workstations&resourceID=10&noHeader>

5.4.3 HMI without control buttons

	NOTE
<p>The webpage is called from the HMI in a web browser frame, if the current order position is assigned to the resource. The task operation is controlled by HMI buttons outside the frame. Otherwise, no frame is shown.</p>	



The workplan step parameter “Free Text (web page)” is used to call the webpage, e.g.

<http://172.21.0.90/l4.0/mes4/EN/mes4.php?content=manual&OpNo=510&Workpiece=2&Action=2>

Configuring the “Free Text (web page)” parameter of a workplan step

MES4 → Master Data → Workplans → [select workplan] → Edit → Free Text (web page)

The URL parameters can be replaced by a hash tag (#) followed by program variable names.

Replacement	Variable
#ONo	Order number
#OPos	Order position
#StepNo	Workpiece part number
#Parameter1	1 st step parameter
#Parameter2	2 nd step parameter
#Parameter..	.. th step parameter

Then, the URL e.g. will be

<http://172.21.0.90/l4.0/mes4/EN/mes4.php?content=manual&OpNo=510&Workpiece=#Parameter1&Action=#Parameter2>

Step

Basics

Step: Next Step:

First Step: Error Step:

Error Step:

Operation

Resource:

Operation: show all

Transport Time [s]:

Working Time [s]:

Electric Energy [Ws]:

Compressed Air [SL]:

Description:

Free Text (Web-Page): do on operation end

Next Part Number:

1	workpiece	<input type="text" value="1"/>	SQL
	<input type="text" value="changable"/>		
2	action	<input type="text" value="3"/>	SQL
	<input type="text" value="changable"/>		
3	part number	<input type="text" value="0"/>	SQL
	<input type="text" value="changable"/>		
4	not used	<input type="text" value="0"/>	SQL
	<input type="text" value="constant"/>		
5	not used	<input type="text" value="0"/>	SQL
	<input type="text" value="constant"/>		
6			

5.5 Operation 510 for Manual Stations (CP-AM-MAN)

5.5.1 Description

Operation 510 represents a generic manual workplace operation with two parameters:

- Workpiece
- Action

The following standard workpieces are defined:

Number	Description
1	Front cover
2	Back cover
3	PCB
4	Front fuse
5	Rear fuse
6	Both fuses
7	Finished workpiece
8	Pallet
9	Carrier
10	Label
11	Inlet
12	Inlet Festo
13	
14	
15	
16	Custom

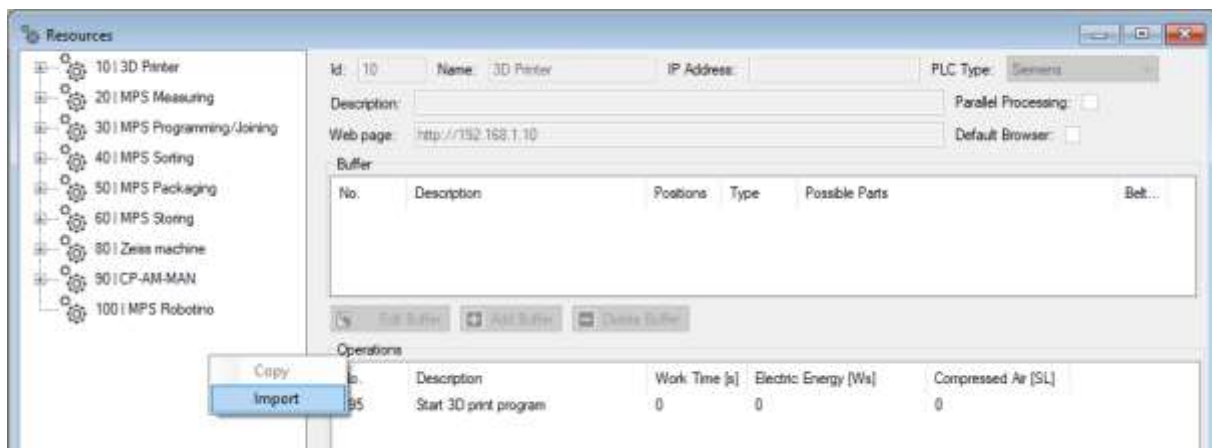
The following standard actions are defined:

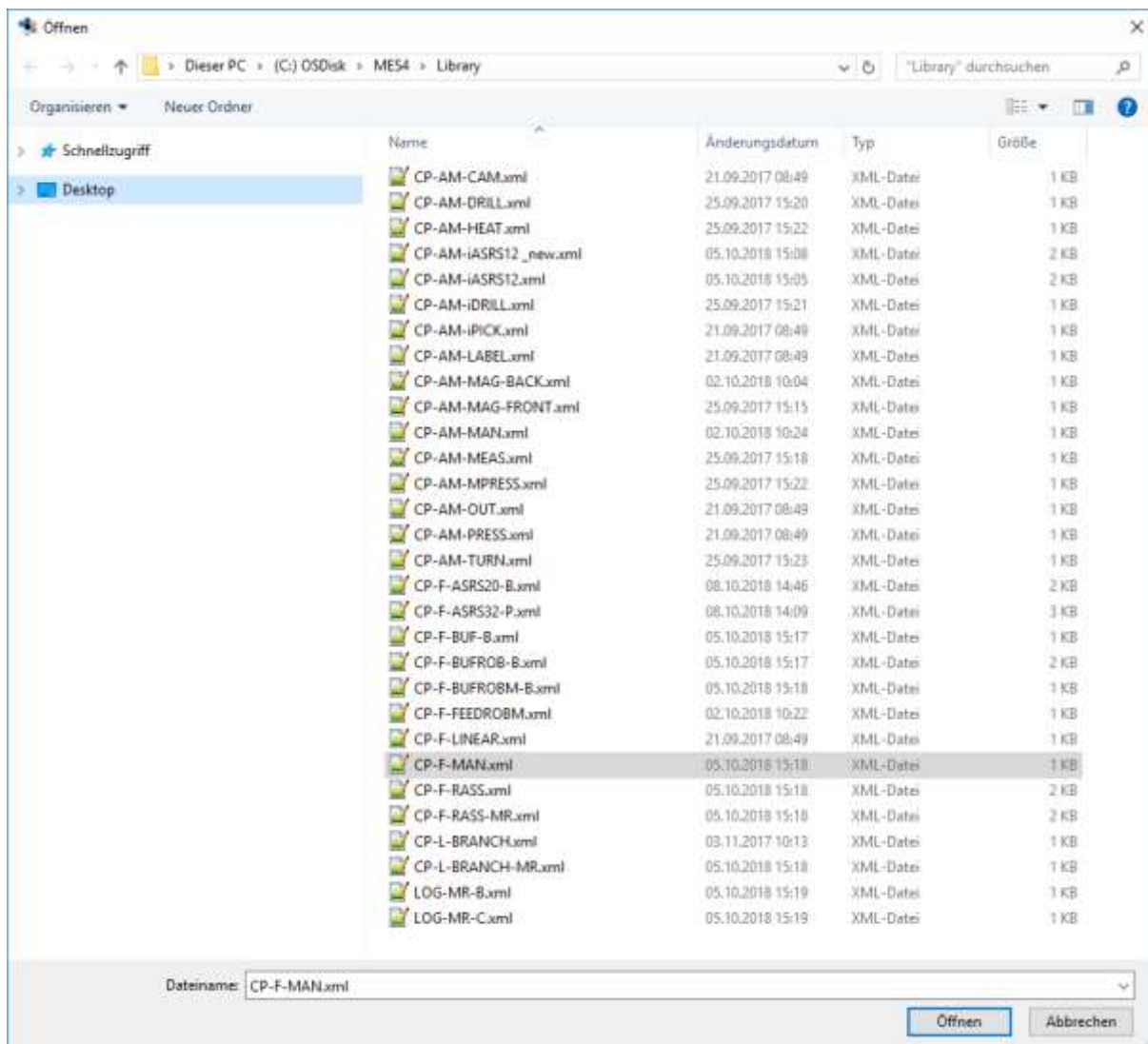
Number	Description
0	No action
1	Check
2	Extract
3	Assemble
4	Insert
5	Apply
6	Rework

5.5.2 Creating a Mobile Workstation for operation 510

To create a Mobile Workstation for the manual operation 510 in MES4 using the template, proceed as follows:

- Master Data
- Resources
- Right click, Import
- Choose “CP-F-MAN.xml”
- Add a new Id
- Save





Resources

id: 90 Name: CP-F-MAN IP Address: PLC Type: Siemens

Description: CP-Factory workplace for manual work with robotino Parallel Processing:

Web page: Default Browser:

Buffer

No.	Description	Positions	Type	Possible Parts	Bel...
1	from AGV	1	from AGV	all	2
2	to AGV	1	to AGV	all	1

Operations

No.	Description	Work Time [s]	Electric Energy [Ws]	Compressed Air [SL]
510	manual work (please insert here the...	4	0	0

Manual Workplace Type: Mobile Workstation

Topology: 1 P, 1 Out

Position (P)

Position (P)	Junction	Resource Position
1	1	0 no resource

5.5.3 Standard pictures

On the iPad at the Mobile Workstation, a picture is shown if a task has to be performed. The picture depends on both parameters workpiece and action.

The operation picture files are located on the webserver at













D:\xampp\htdocs\I4.0\mes4\EN\WorkstationPages\Operations\Pictures\OpNo 510


















and named







wp[wp]-act[act].png

with [wp] the workpiece number and [act] the action number.

The following table lists standard workpieces, actions and corresponding pictures:

Workpiece	Action	2 Extract	3 Assemble,
	1 Check 6 Rework		4 Insert, 5 Apply
1 Front cover			
2 Back cover			
3 PCB			
4 Front fuse			

Workpiece	Action	1 Check 6 Rework	2 Extract	3 Assemble, 4 Insert, 5 Apply
5	Rear fuse			
6	Both fuses			
7	Finished workpiece			
8	Pallet			
9	Carrier			
10	Label			

Workpiece	Action	1 Check 6 Rework	2 Extract	3 Assemble, 4 Insert, 5 Apply
11	Inlet			
12	Inlet Festo			

If additional pictures, e.g. showing details, are available and named wp[wp]-act[act]-2.png, wp[wp]-act[act]-3.png, etc.

they will also be shown on the screen after the main picture.

Example: Workpiece 4, Action 6:

<http://172.21.0.90/l4.0/mes4/EN/mes4.php?content=manual&OpNo=510&Workpiece=4&Action=6>



5.5.4 Custom pictures

Customized operation pictures are located at

D:\xampp\htdocs\l4.0\mes4\EN\WorkstationPages\Operations\Custom Pictures\OpNo 510

Example:

Workpiece		Action		
		6 Turn		
7	Controller	 wp7-act6.png		

If custom pictures are to be used, the parameter “&custom” must be added to the URL, e.g.

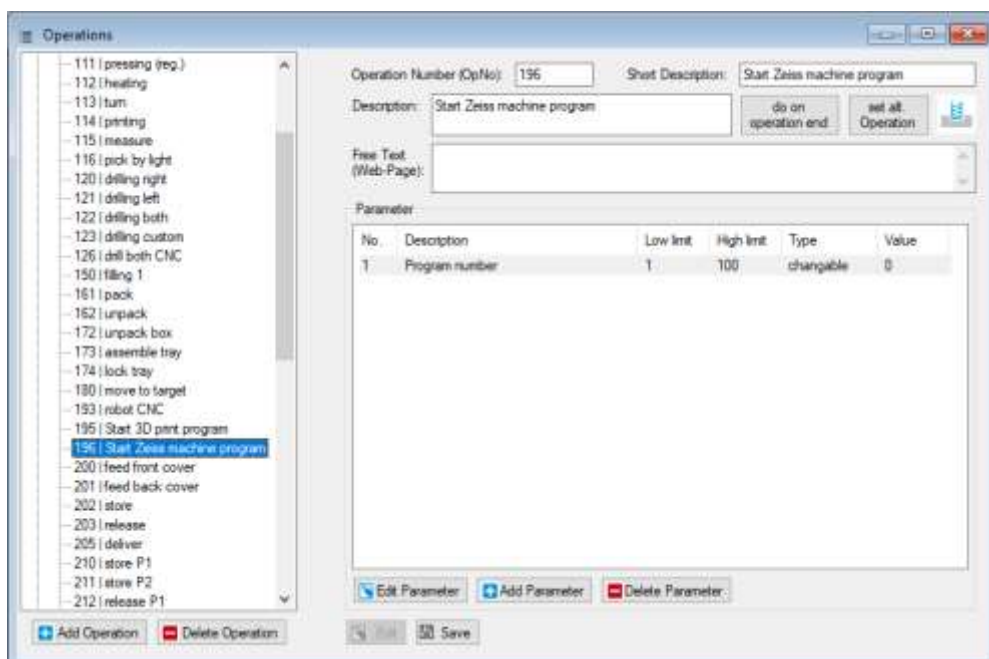
<http://172.21.0.90/l4.0/mes4/EN/mes4.php?content=manual&OpNo=510&Workpiece=2&Action=2&custom>

5.6 Mobile Workstation (CP-F-MAN-Mobile) with custom operation

5.6.1 Creating an operation

To create a new operation for a Mobile Workstation in MES4, proceed as follows:

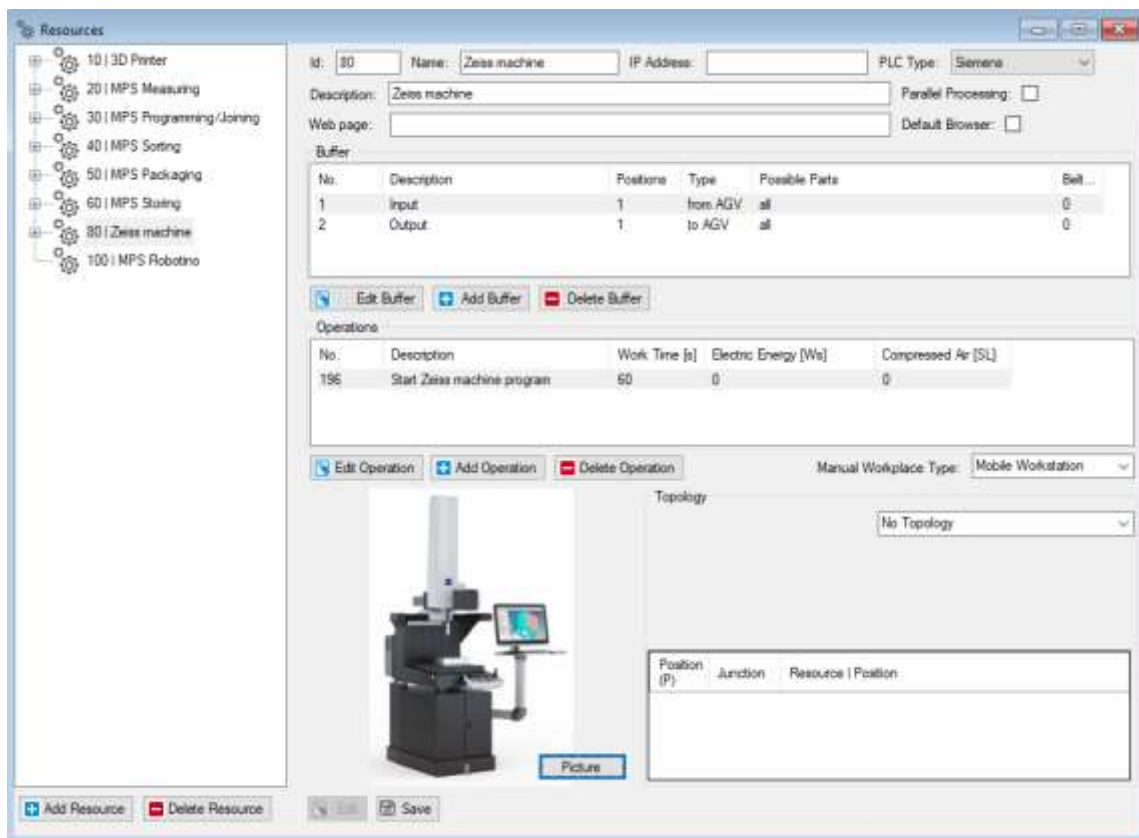
1. Master Data
2. Operations
3. Operations for resources
4. Add Operation
5. Add a new OpNo, here 196, and descriptions
6. Add Parameter (if any), e.g. a program number to be started at the Mobile Workstation.
7. Save

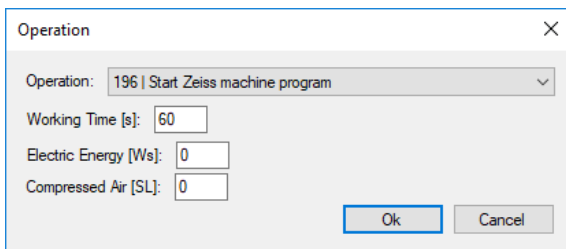
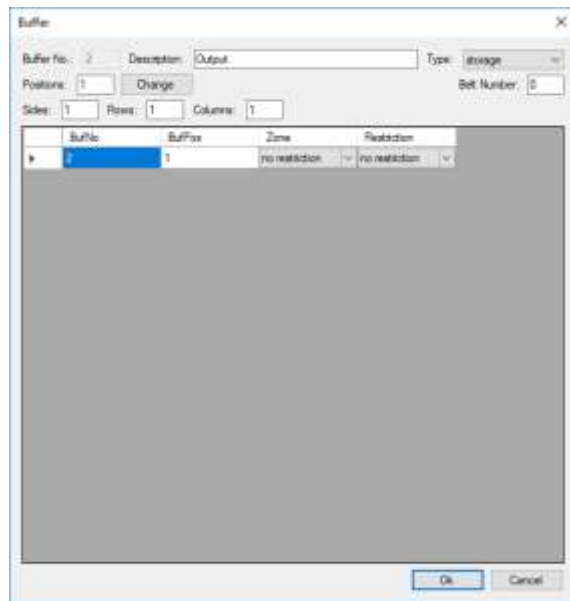
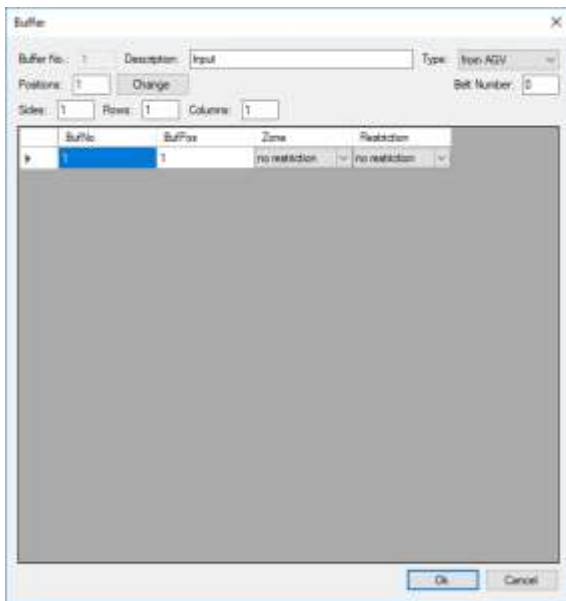


5.6.2 Creating a Mobile Workstation resource

To create a new Mobile Workstation in MES4 and assign an operation to the resource, proceed as follows:

1. Master Data
2. Resources
3. Add Resource
4. Add Id, Name and Description
5. Add Buffer, Type “from AGV” with one position
6. Add Buffer, Type “to AGV” with one position
7. Add Operation 196
8. Select Manual Workplace Type: “Mobile Workstation”
9. Select a picture
10. Save





5.6.3 Webpages for mobile operation

To create a webpage for an operation, locate a file [OpNo].php in the following directory of the webserver:

D:\xampp\htdocs\I4.0\mes4\EN\WorkstationPages\Operations

Example: Operation 196

D:\xampp\htdocs\I4.0\mes4\EN\WorkstationPages\Operations\196.php

```

<!DOCTYPE html>
<!--
=====
=====
=====

196

HTML page with Zeiss order information

Call:
http://172.21.0.90/I4.0/mes4/EN/mes4.php?content>manual&OpNo=196&ONo=
1234&OPos=3&StepNo=1

Requirements: mes4 mobile

Copyright: Festo Didactic SE

=====
=====
=====
=====
=====
-->
<style>
  td.var{
    height:30px;
    width: 40px;
    text-align: center;
  }

  td.param {
    background-color: #DCEBF6;
  }

  td.info {
    background-color: #F6F6F6;
  }
</style>

<?php
  // Read parameters, e.g.
  ProgNo=2&ONo=1234&OPos=3&PNo=210&OpNo=311

  if(isset($_GET['ONo'])) {
    $ONo = $_GET['ONo'];
  }
  if(isset($_GET['OPos'])) {
    $OPos = $_GET['OPos'];
  }
  if(isset($_GET['StepNo'])) {
    $StepNo = $_GET['StepNo'];
  }

```

File comments

Style definitions

Get parameters from URL, if available

```

$sql = "SELECT
      tblStepParameter.Parameter
    FROM
      tblStepParameter
    WHERE
      tblStepParameter.ONo = $ONo AND
      tblStepParameter.OPos = $OPos AND
      tblStepParameter.StepNo = $StepNo AND
      tblStepParameter.ParameterNo = 1";

$ProgNo = sqlGetValue($sql);

$sql = "SELECT
      tblOrderPos.PNo
    FROM
      tblOrderPos
    WHERE
      tblOrderPos.ONo = $ONo AND
      tblOrderPos.OPos = $OPos";

$PNo = sqlGetValue($sql);

// For later use
$sql = "SELECT
      tblResource.Picture
    FROM
      tblResource
    INNER JOIN tblOrderPos ON tblOrderPos.ResourceID =
tblResource.ResourceID
    WHERE
      tblOrderPos.ONo = $ONo AND
      tblOrderPos.OPos = $OPos";

$Picture = sqlGetValue($sql);
?>

<div id="contentArea">
<!-- Begin contents -->

<h2 >Order for ZEISS DURAMAX pending</h2>

<div class="row">
  <div class="column left">
    <h4>Please start the measure program with:</h4>
    <table>
      <tr style="border: none;">
        <td>Program number</td>
        <td class="var param"><?=$ProgNo?></td>
      </tr>
    </table>
    <br>

    <h4>Order information:</h4>
    <table>
      <tr style="border: none;">
        <td>Order number</td>
        <td class="var info"><?=$ONo?></td>
        <td>Part number</td>
        <td class="var info"><?=$PNo?></td>
      </tr>
      <tr style="border: none;">
        <td>Order Position</td>
        <td class="var info"><?=$OPos?></td>
        <td>Operation</td>
        <td class="var info"><?=$OpNo?></td>
      </tr>
    </table>
  </div>
</div>

```

Get parameters from database, if needed

Headline

Table with program information

Table with order information

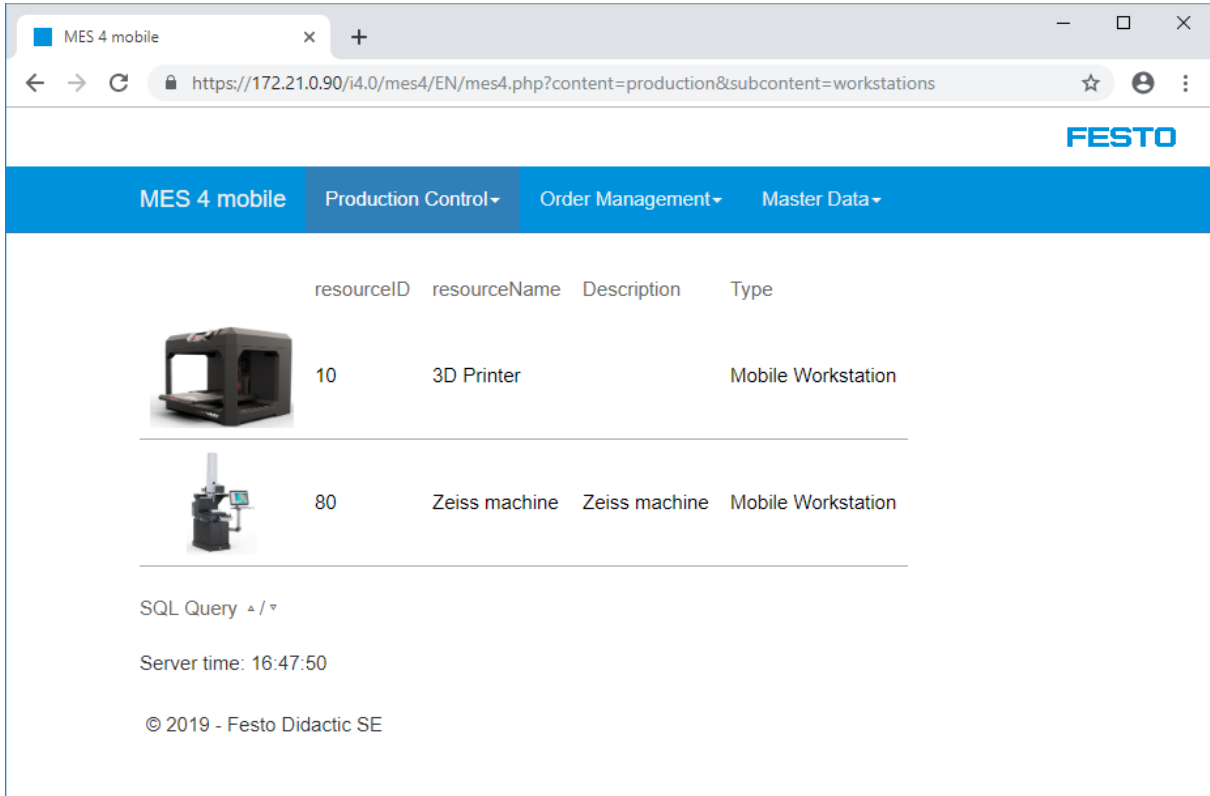
```

<div class="column right">
  <br>
</div>
</div>
</div>

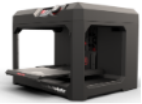
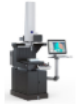
```

} Picture

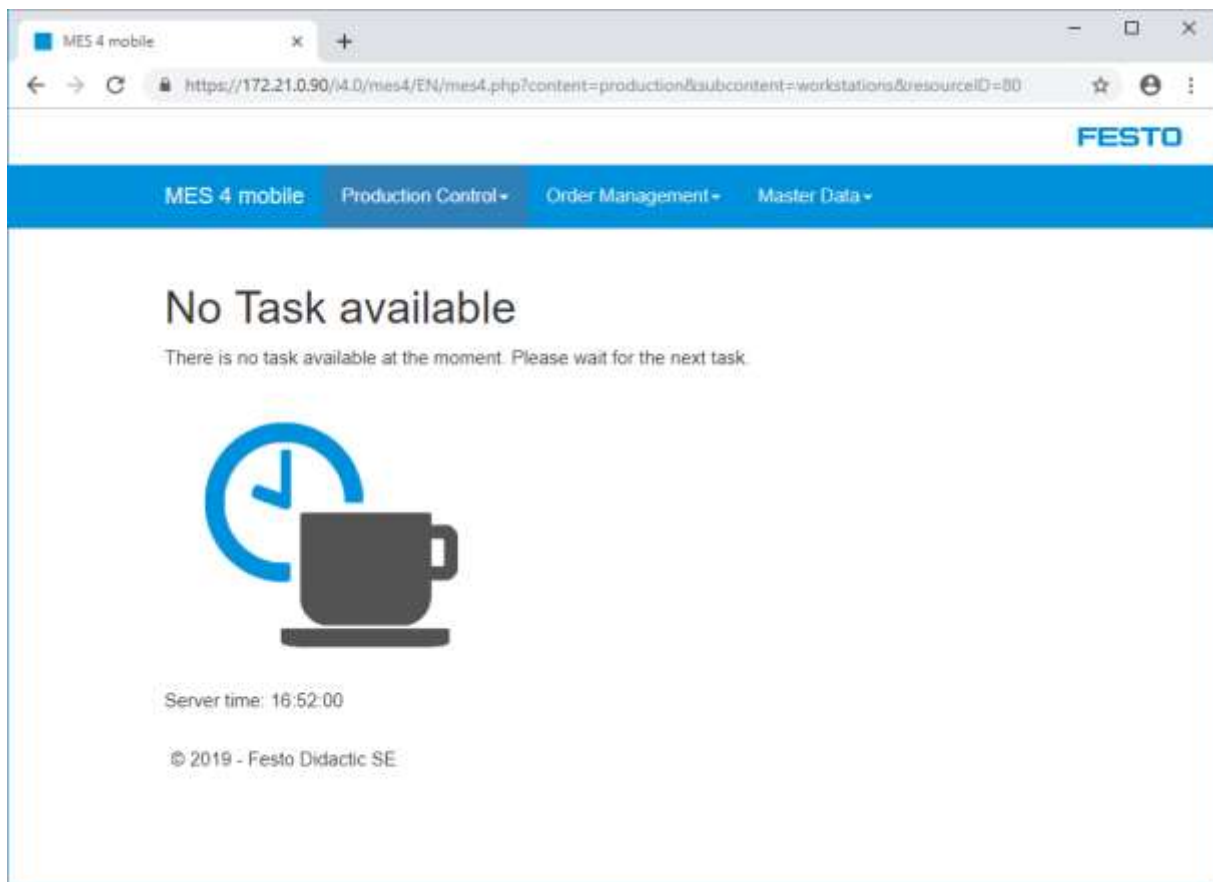
In the web browser view Production Control – Workstations, select resource 80:



The screenshot shows a web browser window titled "MES 4 mobile" with the URL `https://172.21.0.90/i4.0/mes4/EN/mes4.php?content=production&subcontent=workstations`. The page features the FESTO logo in the top right corner and a navigation menu with "MES 4 mobile", "Production Control", "Order Management", and "Master Data". Below the menu is a table of workstations:

	resourceID	resourceName	Description	Type
	10	3D Printer		Mobile Workstation
	80	Zeiss machine	Zeiss machine	Mobile Workstation

Below the table, the page displays "SQL Query ^ / ▾", "Server time: 16:47:50", and "© 2019 - Festo Didactic SE".



If a carrier with an order for the resource arrives, the order details are shown:




6 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.

	<p style="text-align: right;"><i>NOTE</i></p> <p>Do not use aggressive or abrasive cleaners.</p>
---	---

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


7 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



8 Disposal

	<p style="text-align: center;"><i>NOTE</i></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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