

Quotation/Proforma Invoice 125.132

Project Worlskills 2024

Date 17.03.2023

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Customer No. 195586

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Festo Didactic – Technical Education Solutions

Festo Didactic is the world-leading provider of equipment and solutions for industrial education. We design and implement learning centers and laboratories, educational equipment and programs that train people to perform in highly dynamic and complex industrial environments. Our goal is to maximize learning success in educational institutions and industrial companies around the globe.

Festo Didactic educational solutions directly evolve from technologies and innovations in automation and engineering. They place students in real-life situations and enable them to gain practical experience with high-tech industrial components and current systems. The product design focuses on excellence in usability and practice orientation: All functional components stand out from their complex industrial surroundings. They are easy to use and easy to remember. Their specific functions, positions and connections within the learning system intuitively show how technologies really work.

All learning environments, such as learning factories, laboratory equipment and e-learning products, are offered in conjunction with technical, organizational and people-oriented training programs – in 40 languages worldwide – and are associated with services like planning and operating complex learning centers, and with consultancy services for industrial companies.



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Position Quantity	Description				
Description CP La	b				
CP Lab – Industry 4.0 r	right from the start				
	<image/>				

CP Lab – The compact Industry 4.0 learning system

The Cyber-Physical Lab is the professional and compact industry 4.0 learning system from Festo Didactic. It contains the relevant technologies and components to provide comprehensive industry 4.0 knowledge.

The modular and flexible design allows working in different learning scenarios: from the individual pallet transfer system with integrated control to the networked production facility with cloud services.



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CP Lab – A versatile system

The modularity of the factory layout is one of the most important features of Industry 4.0. The CP Lab modules can be combined and expanded in a variety of ways.

In sequence

By simple combinations of the individual modules, different system configurations can be realised.

In circulation system

The individual modules can be easily combined "over corner". This means that complete circulation systems can already be implemented with four, six, eight or ten modules.

In combination with mobile robot

The CP Bridge (Branch) is used, as a supplementary module for CP Lab transfer system, to transport workpiece carriers to the next working position. The CP Bridge is the main interface which enables the handover of workpieces from CP Lab to the mobile robot system Robotino® and to CP Factory modules.

The system at a glance

Main components:

- Integrated control
- Mono-belt transfer system
- Pallet stopper
- 3/2-way valve
- Inductive sensors
- Capacitive sensors at the beginning and end of the conveyor
- RFID-read/write sensor
- Identification system, binary
- DC or AC motor
- Motor controller, bidirectional with 2 speed levels
- Incremental encoder
- IO-Link Master
- IO-Link Device
- Analogue I/O via IO-Link











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Position	Quantity	Description			
•	Control pan	el			
RFID proo In CP Lab with a RFI	cess control the workpie ID-tag on wł	ece takes over the process control. Every carrier is equipped hich workpiece parameters are stored.			
Following • • • •	g applicatio Magazine Turning Camera ins Tunnel over Drilling	n modules are available: pection n		0 mm	
• • • • • • • • •	Press Measure ar Workpiece Labelling Pick-by-Ligl Dosing	nalogue output ht			

Further application modules on request.



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Position Quant	ty	Description			



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Position	Quantity	Description		•	
CP Lab P	allet Tra	nsfer System stations			
Pos. 1	1,00	CP LAB CONVEYOR DC-1512SP			_
		D12501			
		Function		Pictur	o cimilar
		The convoyor is the main component of the CP Lab and is used to t	trancnart	Tietur	e sinnar
		workpiece carriers to the next working position. The identification	of		
		workpieces is done via capacitive sensors at the beginning and at	the end of the		
		conveyor. Every carrier is equipped with a RFID-tag on which work	piece		
		workpiece that communicates through an IO-link-interface with th	e		
		main Controller. The CP Lab Conveyor is equipped with a PLC and a	all necessary		
		interfaces in order to be complemented by an application module	and to		
		communicate with the mes.			
		Highlights:			
		A compact Industry (0 Learning System – The CP Lab Co	nyovor is		
		"ready for Industry 4.0" because of its clearly defined m	echanical and		
		electrical interfaces as well as the use of open standards	·.		
		 A modular and flexible layout – The modular and flexible makes working in various learning congrises possibles fr 	design		
		transfer system with an integrated controller up to a cros	ss-linked		
		production system with cloud services.			
		 Modern industry supervision – The embedded modular of 1513SB makes the system a colf intelligent industry 6.0 	controller S7		
		The learning content is part of the application module –	The		
		application modules are mounted on the conveyor and a	re controlled		
		via I/O, Profinet, TCP/IP, OPC UA or Plug & Produce - dep	pending on		
		the type of the module.			
		Learning content for project work:			
		Installation and structure of manufacturing plants			
		Capture of information using intelligent sensors			
		PLC programming			
		Control via embedded controllers* Communication bacod on open standards			
		Industrial communication and IT-security*			
		Fieldbus technology			
		Identification systems			
		Plug & Produce: Quick modification*			
		Cyber-physical systems*			
I		 Production management with MES*: Creation, managem controlling and visualization of customer orders 	ient,		



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Position	Quantity	Description			
Position	Position Quantity Description Use of the cloud technology* (* These topics require additional products) Main components: Mono-belt transfer system length 700 mm, width 80 Pallet stopper with sensors and valve Pallet identification BCD with 4 inductive sensors Pallet identification RFID on I/O-Link Capacitive sensor at the beginning and the end of th PLC Siemens S7-1500 CPU 1512SP 16 inputs/16 outputs digital 24 V Siemens I/O-Link Master Festo I/O-Link Device 8 inputs/8 outputs digital, 4 ir outputs analogue 		nveyor s/2	17.03.2023	9/33
		 Conveyor drive 24 VDC DC motor controller bi-directional and creep speed I/O interface for application module Syslink 8 inputs/8 outputs Interface for control panel with 4 inputs/4 outputs and Emergency Stop Note: The optional touch panel and the application modules are not included in this item.			



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Quantity	Description		·	
1,00	CP Lab Touch panel Siemens TP700 Comfort wi	th HMI case		-
	D12605		- 18	
	Description			
	The CP Lab Touch Panel TP700 Comfort is used	for operator control and		
	actuators and lamps also a Siemens Touch Panel functionality. The touch panel is complete integ	addition to the classical al TP700 Comfort with high-end rated, wired and tested.	Pictur	e similar
	The Human Machine Interface (HMI) consists of	a case and a console with		
	classical buttons and lamps. It is plugged to the	CP Lab Conveyor by means of entry and monitoring unit. The		
	HMI case is mounted on the profile frame of the	conveyor. In the basic		
	indicators. If required, the HMI case can be equi	ipped with additional 8 electrica	l	
	actuators/indicators and up to 8 potential-free a circuits.	switching contacts for safety		
	Features:			
	Widescreen-Display with 16 Mio. color High and functionality: Archiving VR	urs and LED backlighting		
	showing plant documentation (i.e. as	PDF) or as web-browser		
	Data backup	unication		
	 Integrated PROFINET-Switch 	JIIICALIOII		
	Programming from WinCC Comfort V1	L (TIA Portal)		
	Technical data:			
	• 7.0" Widescroop TET Display			
	 Resolution: 800 Pixel x 480 Pixel 			
	• Number of colours: 16 Mio.			
	 Touch screen 2 Ethernet interfaces 			
	1 Profibus interface			
	• 2 USB interfaces with integrated switc	h		
	 Dimensions (B x H x I): 214 x 158 x 70 Supply voltage: 24 V DC 	mm		
	Current consumption: 0,5 A			
	Process coupling:			
	 \$7-1200, \$7-1500 \$7-200, \$7-300/400 			
	Quantity 1,00	Worldskills Lyon 2024 – Single Workplace Quantity Description 1,00 CP Lab Touch panel Siemens TP700 Comfort wi D12605 Description The CP Lab Touch Panel TP700 Comfort is used i monitoring. Thus, the control panel includes in a actuators and lamps also a Siemens Touch Pane functionality. The touch panel is complete integ The Human Machine Interface (HMI) consists of classical buttors and lamps. It is plugged to the I/O cable and is used as control panel for signal HMI case is mounted on the profile frame of the configuration, the HMI case is equipped with 4.4 (indicators. If required, the HMI case can be equi actuators /indicators and up to 8 potential-free si circuits. Features: • Widescreen-Display with 16 Mio. color • High-end functionality: Archiving, VB-s showing plant documentation (i.e. as I • Data backup • Different interfaces for process commu • Integrated PROFINET-Switch • Programming from WinCC Comfort V1: Technical data: • 7,0" Widescreen TFT-Display • Resolution: 800 Pixel x 480 Pixel • Number of colours: 16 Mio. • Touch screen • 2 Ethernet interfaces • 1 Profibus interface • 2 USB interfaces with integrated switc • Dimensions (B x H x T): 214 x 158 x 70 • Supply voltage: 24 V DC • Current consumption: 0,5 A Process coupling: • \$7-1200, \$7-1500 • \$7-200, \$7-300/400	Worldskills Lyon 2024 – Single Workplace 125.132 Quantity Description 1.00 CP Lab Touch panel Siemens TP700 Comfort with HMI case D12605 Description The CP Lab Touch Panel TP700 Comfort is used for operator control and monitoring. Thus, the control panel includes in addition to the classical actuators and lamps also a Siemens Touch Panel TP700 Comfort with high-end functionality. The touch panel is complete integrated, wired and tested. The Human Machine Interface (HMI) consists of a case and a console with classical buttons and lamps. It is plugged to the CP Lab Conveyor by means of I/O cable and is used as control panel for signal entry and monitoring unit. The HMI case is mounted on the profile frame of the conveyor. In the basic configuration, the HMI case is equipped with 4 electrical actuators and 4 light indicators. If required, the HMI case can be equipped with additional 8 electrica actuators/indicators and up to 8 potential-free switching contacts for safety circuits. Features: • Widescreen-Display with 16 Mio. colours and LED backlighting • Data backup • Different interfaces for process communication • Integrated PROFINET-Switch • Programming from WinCC Comfort V11 (TIA Portal) Technical data: • 7,0" Widescreen TFT-Display • • Vides Streene 12 VSB interfaces • 12 VSB interfaces • • Technical data: • 7,0" Widescreen TFT-Displ	Worldskills Lyon 2024 – Single Workplace 125.132 17.03.2023 Quantity Description Image: CP Lab Touch panel Siemens TP700 Comfort with HMI case Image: CP Lab Touch Panel TP700 Comfort is used for operator control and monitoring. Thus, the control panel includes in addition to the classical actuators and lamps also a Siemens Touch Panel TP700 Comfort with high-end functionality. The touch panel is complete integrated, wired and tested. Image: CP Lab Touch Panel TP700 Comfort is used for operator control and monitoring. Thus, the control panel includes in addition to the classical actuators and lamps. It is plugged to the CP Lab Conveyor by means of CI cable and is used as control panel for signal entry and monitoring unit. The HMI case is mounted on the profile frame of the conveyor. In the basic configuration, the HMI case is sequipped with 4 electrical actuators and 4 light indicators. If required, the HMI case can be equipped with additional 8 electrical actuators in digit indicators. If required, the HMI case can be equipped with additional 8 electrical actuators for safety circuits. Features: • Widescreen-Display with 16 Mio. colours and LED backlighting • High-end functionality: Archiving, VB-script and various viewers for showing plant documentation (i.e. as PDF) or as web-browser • Data backup • Different interfaces for process communication • Integrated PRO/INET-Switch • Programming from WinCC Comfort V11 (TIA Porta) Technical data: • 7,0° Widescreen TFT-Display • Resolution: 300 Pixel x 480 Pixel • Low Screen • 2 Ethernet interfaces • 1 Profibus interfac



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Position	Quantity	Description • LOGO! • WinAC • Allen Bradley (EtherNet/IP) • Allen Bradley (DF1) • Mitsubishi (MC TCP/IP) • Mitsubishi (FX) • OMRON (Host Link) • Modicon (Modbus TCP/IP) • Modicon (Modbus RTU)			
		 Main components of the HMI case Metal case Circuit board Electrical actuators Light indicators Emergency stop VESA mounting plate Carrying arm Connector for Profinet Connector for safety circuits Connector for control panel (basic configuration) Connector for control panel (extended configuratior Cable set))		
		 System requirements: 64 Bit: Windows 7 Professional, Enterprise, Ultimate 8.1 Professional, Enterprise 32 Bit: Windows 7 Professional, Enterprise, Ultimate Scope of delivery: Siemens Touch Panel TP700 Comfort Ethernet cable (CAT 6, crossover, 6 m) Engineering-, Options- and Runtime software and line 	e SP1, Windows e SP1 cense WinCC		
		Advanced (TIA-Portal) Note: This product requires a license for the end user to be us educational purposes. Festo provides the declaration text on does not provide this declaration or does not deliver it on tim obliged to deliver this product.	sed exclusively for a form. If Festo e, Festo is not		



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Position	Quantity	Description			
Pos. 3	1,00	Switch XB008			<u> </u>
		D12725			
		SCALANCE XB008 unmanaged Industrial Ether LED diagnostics, IP20, DC 24V power supply, v pair ports with RJ45 sockets;	rnet Switch for 10/100 Mbit / s; with 8x 10/100 Mbit / s twisted		
		Note: this unmanaged switch is not for advanced network scenarios such as ring high availability, VLAN operation, and others. suitable. We are happy to advise you on further variants for the implementation of these topics.			
				Pictur	e similar
Pos. 4	1,00	Edutrainer			6
		159396		· · · · · · · · · · · · · · · · · · ·	÷0 · ·
		Power supply unit for mounting frame		*	B b c e e e e e e e e e e
		 Input voltage: 85 – 265 V AC (47 – 63) 	3 Hz)		° O
		• Output voltage: 24 V DC, short-circu	it-proof		
		• Output current: max. 4 A			-
		• Dimensions: 170 x 240 x 92 mm		Pictur	e similar
		Type: Connector as per CEE 7/VII for DE, FR, N TR, IT, DK, IR, ID	O, SE, FI, PT, ES, AT, NL, BE, GR,		



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Position	Quantity	Description			<u>d</u>	
CD Annli	cation me	dulac				
Pos. 5	1.00					
Pos. 5	1,00	APPLICATION MODULE MEASURING D13019 Function The application module measuring can modules as well as on CP Lab conveyor mounted on adjustable stands and are measurement of workpieces at 2 differ connected to an I/O terminal, which ca nodes (Profinet I/O). The application m tested. Learning content: Mechanical and electrical des Analog measurement techno and relative measurement Fieldbus technology Sensor technology PLC programming) be mounted on CP Factory rs. Two laser distance sense used for analogue differen ent measuring points. The s n optionally be exchanged l odule is completely assem sign of the module logy: Differential measurem	basic ors are tial sensors are by fieldbus bled and nent/absolute	Picture	e similar
		 Communication with superior Consisting of: 1x Module frame made from 2x Laser distance sensor 2x Measurement stand 1x Signal tower, 3 colours 1x Signal interface Technical Data Interface analogue Voltage Dimensions (H x W x D) Size of workpiece (L x W) Measuring range Measuring signal 	Analogue terminal 2 Inputs 24 VDC 775 mm x 240 mm x 255 r 115 mm x 80 mm 10 - 80 mm Max. 0,2 mm 0 - 10 V	nm		



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Position	Quantity	Description							
Pos. 6	1,00	CAMERA SYSTEM							
		8158958		f					
		Machine Learning in Image Processing]					
				4					
		The MPS Io1 Kit Machine Learning deals with machine learning bas networks ("deep learning"), one of the most prominent sub-discip	sed on neural lines of	Picture	similar				
		artificial intelligence. The hardware includes a single-board compu	iter equipped	Tieture	Similar				
		network.	neural						
		A variety of Python programmes are available as software. The from	nt ends of						
		smartphones, tablets, laptops, etc. is possible. Thanks to the Wi-F	i hotspot, the						
		MPS IoT Kit Machine Learning offers wireless remote access. The s	ystem is ents						
		immediately.							
		topics in machine vision with machine learning is for learners to learn the basic							
		two learning methods supervised and unsupervised machine learn	ning						
		classification, object localisation and multiple object recognition -	are						
		presented and discussed through a series of hands-on experiment	S.						
		Learners will be able to distinguish apples from lemons or tools fro	om shoes, etc.						
		A possible task for integration into a learning factory is to check th	e filling level						
		of chutes with workpieces by applying machine learning technique	es. Otherwise,						
		all kinds of objects can be recognised and localised. In addition, polyneural network architectures such as so-called convolutional neur	owerful al networks						
		are used.							
		All software is well desumented and enables learners to conduct t	hoirown						
		machine vision experiments outside the learning factory. Prior pro	gramming						
		knowledge is not required. The learning materials encourage learn	iers to						
		Learning content							
		Artificial intelligence/machine learning in image process	inσ						
		 Practical application of convolutional neural networks/de 	eep learning						
		Supervised and unsupervised machine learning							
		 Computer vision (image classification, object localisation detection) 	n, multi-object						
		IoT retrofitting of legacy systems							
		Depertite							
		Benefits							



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Position Quantity	 Description The MPS IoT Kit Machine Learning can either be used staintegrated into existing learning factories Learners have the opportunity to apply the algorithms to and images Focus on practical application of artificial intelligence/m learning to solve real-world challenges Key components Single board computer with HD camera Ethernet cable HDMI cable Power connector Technical data Power supply: 110/230 V AC/1 A Dimensions (W x H x D): approx. 200 x 200 x 600 mm 	nd-alone or new objects achine		
Accessories	1			
Pos. 7 1,00	CARRIAGE D12720 Description The carriage makes the CP Lab system into a compact and mobile Lab conveyor can be easily mounted on the carriage. The carriage is designed for the use of CP Lab conveyor and is suit combination with CP Factory. The carriage will be delivered including rollers and adjustable feet Technical data: • Dimensions (H x W x D): 800 mm x 540 mm x 350 mm • Frame: A4 in undercarriage	unit. The CP able for the	Picture	e similar



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Position	Quantity	Description			
Pos. 8	1,00	Door for carriage D12720 D12724 Transparent doors for CP Lab carriage D12720.			
Pos. 9	1,00	 WORKPIECE CARRIER D12703 Description The workpiece carrier is used to transport workpieces or pallets wirworkpieces on CP Lab or CP Factory pallet transfer systems. For ide the workpiece carrier is equipped with a RFID-tag and 4 bit code. Technical data: Design: Glass fiber reinforced plastic (GRP) Dimensions: 100 mm x 160 mm x 15 mm BCD Code: codeable, 4 screws Track width: 80 mm Transport weight: max. 3 kg 	th entification,	Pictur	e similar
Pos. 10	1,00	PALLET D12704 Description The pallet is used to transport workpieces on CP Lab or CP Factory transfer systems. The pallet, on which the workpiece is transported the workpiece carrier (D12703). Technical data: Design: Aluminium Dimensions: 100 mm x 160 mm x 5 mm Workpiece holder: changeable, screwed 	pallet d is placed on	Pictur	e similar



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Quantity	Description						
2,00	WORKPIECE FRONT COVER BLACK D12705						
	Description		Pictur	e similar			
	The workpiece set, consisting of a back cover, printed circuit board, electronic component and front cover, is used for the representation of many relevant process steps such as milling, drilling, marking, tempering, testing, turning, assembling, loading, pressing and more.						
	The front cover is part of the workpiece set.						
	Technical data:						
	 Material: Plastic, black Dimensions: 110 mm x 60 mm x 10 mm 						
2,00	WORKPIECE FRONT COVER GREY D12709 Description The workpiece set, consisting of a back cover, printed circuit boar component and front cover, is used for the representation of many process steps such as milling, drilling, marking, tempering, testing assembling, loading, pressing and more. The front cover is part of the workpiece set. Technical data: • Material: Plastic, grey • Dimensions: 110 mm x 60 mm x 10 mm	d, electronic y relevant g, turning,	Pictur	e similar			
	Quantity 2,00	Project Worldskills Lyon 2024 – Single Workplace Quantity Description 2,00 WORKPIECE FRONT COVER BLACK D12705 Description The workpiece set, consisting of a back cover, printed circuit boar component and front cover, is used for the representation of mam process steps such as milling, drilling, marking, tempering, testing assembling, loading, pressing and more. The front cover is part of the workpiece set. Technical data: • Material: Plastic, black • Dimensions: 110 mm x 60 mm x 10 mm 2,00 WORKPIECE FRONT COVER GREY D12709 Description The workpiece set, consisting of a back cover, printed circuit boar component and front cover, is used for the representation of mam process steps such as milling, drilling, marking, tempering, testing assembling, loading, pressing and more. The front cover is part of the workpiece set. Technical data: • Material: Plastic, grey • Material: Plastic, grey • Dimensions: 110 mm x 60 mm x 10 mm	Project Decument No. Worldskills Lyon 2024 – Single Workplace 125.132 Quantity Description 125.132 2,000 WORKPIECE FRONT COVER BLACK D12705 Description The workpiece set, consisting of a back cover, printed circuit board, electronic component and front cover, is used for the representation of many relevant process steps such as milling, drilling, marking, tempering, testing, turning, assembling, loading, pressing and more. The front cover is part of the workpiece set. Technical data: • Material: Plastic, black • Dimensions: 110 mm x 60 mm x 10 mm 22,00 WORKPIECE FRONT COVER GREY D12709 Description The workpiece set, consisting of a back cover, printed circuit board, electronic component and front cover, is used for the representation of many relevant process steps such as milling, drilling, marking, tempering, testing, turning, assembling, loading, pressing and more. The front cover is part of the workpiece set. Technical data: • Material: Plastic, grey • Dimensions: 110 mm x 60 mm x 10 mm	Project Document No. Date Worldskills Lyon 2024 – Single Workplace 125.132 17.03.2023 Quantity Description			



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Position	Quantity	Description			
Pos. 13	2,00	WORKPIECE FRONT COVER BLUE			
		D12711			
		Description		Pictur	e similar
		The workpiece set, consisting of a back cover, printed circui- component and front cover, is used for the representation o process steps such as milling, drilling, marking, tempering, t assembling, loading, pressing and more.	t board, electronic f many relevant testing, turning,		
		The front cover is part of the workpiece set.			
		Technical data:			
		 Material: Plastic, blue Dimensions: 110 mm x 60 mm x 10 mm 			
Pos. 14	2,00	WORKPIECE FRONT COVER RED			
		D12713			
		Description		Dictur	o cimilar
		The workpiece set, consisting of a back cover, printed circuic component and front cover, is used for the representation o process steps such as milling, drilling, marking, tempering, t assembling, loading, pressing and more.	t board, electronic f many relevant testing, turning,	Fictur	e sillildi
		The front cover is part of the workpiece set.			
		Technical data:			
		 Material: Plastic, red Dimensions: 110 mm x 60 mm x 10 mm 			



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Pos. 15	1,00	FactoryViews MES4 V3 for CP Lab			
				a bitter i b	
		Description:		Pictur	e similar
		The MES4 V3 controls production orders in real time, just lik and takes on a central software function in manufacturing. T combines classic MES functionalities with the new opportuni growing interconnected networks in the Industrial Internet o MES4 V3 is specifically focused on educational suitability an perfect for use in training and teaching courses in industrial	e in a real factory, he MES4 V3 ities offered by the of Things. Ind is therefore automation. All		
		relevant functions can be accessed quickly and intuitively via based user interface.	a the browser-		
		FactoryViews MES4 V3 supports CP Lab and MPS 400 system	ns.		
		The function range includes:			
		Graphical system configurator with station library			
		Graphical workplan editor, including processing tin consumption	ne and energy		
		Production control via service-oriented architecture	e (SOA)		
		Communication with resources via TCP/IP or OPC L	JA		
		Order management			
		Graphical live tracking of workplan steps			
		Operator view with status indicator per resource			
		Reporting of S7 PLC warnings and errors			
		• Editor for database analyses, e.g. OEE or quality, w	ith live diagrams/		
		Import and export functions for layouts, work schere evaluations in standard formats such as CSV and JS	dules, orders and SON		
		Layout export to CIROS			
		• Software languages: DE, EN, FR, PT, HU, ZH			
		Interfaces: TCP/IP, REST, SQL			
		Thanks to its integration with FactoryViews, MES4 V3 also be seamless interaction with other apps such as our educationa platform-independent operation, and the snapshot function, statuses to be backed up and restored to a file with just one	enefits from a al webshop, , which allows work click.		



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		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	20 / 33
Position	Quantity	<text></text>	rs within the		
Pos. 16	1,00	Web shop for MES4 D17012 Modern web shop for ordering configurable product variants. The product properties selected by the online ordering party are tr from the Web shop to the Manufacturing Execution System MES4, ensures and monitors the production in the plant. Course contents: Industry 4.0 ERP functions examples Configuration of a webshop MES connection The customer can place orders via the webshop running on the set browser is necessary to access the webshop from PCs or mobile do as tablets, smartphones or laptops. The customer sees in the com order directly the total cost of the cart. The prices for the individual products in the different variants are managed. For sales orders, delivery notes and invoices can be printed out. At production process with too low stock is also possible. Each newly product can be configured for the webshop and is then available o shop as a selection. properties Ereely configurable	rver. Only a evices, such pilation of his I parts of the n automated <i>t</i> defined nline in the	Image: second	e similar



Customer No.		Project	Document No.	Date	Page
195586		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	21 / 33
Position	Quantity	Description Network communication Parallel commissioning of several plants Server with database set up on PC to be ordered separately (for example MES PC) Communication between web shop and MES Inventory management system Individual pricing of the products Print preview of delivery notes and invoices Large statistics area about orders, sales, customers, country overview Order via the local network, also possible over the internet with Cloudpaket Personalized order Different prices for different variants Indication about availability MES + MES mobile Live view of the order list E-mail dispatch for order tracking The data of the system is stored in a MySQL database, which can be easily accessed via a preinstalled user interface. All data can be exported in different formats (e.g., CSV).			
Pos. 17	1,00	Equipment Set TP1312 Smart Sensors 8116358 Equipment Set TP1312 Smart Sensors The Equipment Set TP 1312 Smart Sensors includes a basic selecti sensors with IO-Link® communication: diffuse photoelectric sensor proximity sensor and ultrasonic sensor. Along with the sensors, th package includes an IO-Link® master with 4 sensors communicati 3 different Ethernet protocols (PROFINET®, EtherNet/IP™ or Modi communicate with programmable logic controllers and other facto automation devices along with all the necessary cables. All components of TP 1312 are mounted on our Quick-Fix® mount and are compatible with the Sensor Workstation (8110729) or one plates.	ion of smart or, inductive e training on ports and bus® TCP) to ry ing system e of our profile	Picture	e similar
		 Features Uses the most important smart sensors in Industry 4.0 with a complearning path Uses the most important smart sensors in Industry 4.0 w comprehensive learning path Industrial IO-Link® communication master module with 2 Ethernet protocols Enables building IO-Link® communication setups just like industry with sensors, IO-Link® master and PLC with possmart interface also in the learning experience Easy to integrate the specific smart sensors you need wit curriculum Develops new skills for the newest smart sensor technologies 	prehensive ith a 3 different se in the ssibility to add th the right		



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195586		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	22 / 33		
Customer No. 195586 Position	Quantity	Worldskills Lyon 2024 – Single Workplace 125.132 17.03.2023 22 / 3 Description • Prepares students for further learning in factory automation Learning goals Students will follow the scope of the training curriculum from an initial understanding of Industry 4.0 concepts and sensors fundamental principles. Then, through a comprehensive learning path, students will develop the most important competencies regarding smart sensors and their benefits in industry. Competencies to be developed include: • Understanding the benefits of smart sensors in the context of Industry 4.0 • Selecting sensors for the right applications • Setting up IO-Link® communication and parameterize smart sensors in the field		Page 22 / 33			
		 Monitoring and analyzing data to perform predictive main replace defective sensors quickly Integrating smart sensors to programmable logic control different manufacturing communication layers Troubleshooting sensors 	 Monitoring and analyzing data to perform predictive maintenance and replace defective sensors quickly Integrating smart sensors to programmable logic controllers and the different manufacturing communication layers Troubleshooting sensors 				
		 Scope of delivery: One (1) diffuse photoelectric sensor with IO-Link® (811 One (1) inductive proximity sensor with IO-Link® (8110727) One (1) ultrasonic sensor with IO-Link® (8110729) One (1) IO-Link® master module with 4 ports (8110729) One (1) accessories kit for Equipment Set TP1312 Smar (8112723) Also requires the following accessories (not included): Se Workstation (8110723) or a profile plate for Quick-Fix® r system combined with 24 V dc power supply 	.0725) 726) t Sensors ensor mounting				



Customer No.		Project	Document No.	Date	Page
195586		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	23 / 33
Position	Quantity	Description			
Pos. 18	1,00	Accessories for Smart Sensors			
		Accessories for TP 1312 consisting of			
		 Slide unit 572740 Slide unit 572740 Set of test objects 549830 Set of test objects 549830 			
		• RFID sensor with IO-Link® 8110728			



Customer No.		Project	Document No.	Date	Page
195586		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	24 / 33
Position	Quantity	 Flow sensor with IO-Link® 8115026 			
		• Systainer® with T-LOC system 8022297			
		• Systainer/container insert B 687461			
		• Handles for Systainer 683012			



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195586		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	25 / 33
Position	Quantity	Description			
Pos. 19	1,00	CIROS 7 8140772		Pictur	e cimilar
		CIROS 7		Fictur	e sinnai
		CIROS is an industrially tested, extremely pow using 3D simulation models for automation te following functions into a single common inte	verful platform for creating and chnology. It combines the rface:		
		 Discrete time 3D simulations with m CAD import filter for STEP, IGES, STL CAD export filter for conventional for Layout of systems and production linapplication modules Access to more than 1100 robot mod Robot programming in the following others: Industrial Robot Language (IRL) Mitsubishi MELFA BASIC V Kuka Robot Language (KRL) ABB Rapid Connection to the Manufacturing Excoperating training factories as a dida operating training factories as a dida Virtual human with 30 independent The extensive model library contains Beginner models for an introductio Further course documents in Festo Virtual illustrations from the Festo MPS and Robotino for transferring lesimulated and physical devices Prepared examples on industrial ir Advanced The model is either controlled via the through the use of other interpreters interfaces to PLCSIM and PLCSIM Ad Additional connections to other OPC CODESYS are established using OPC EasyPort is used for coupling up to f simulation control (hardware in the I Matlab, Python or EtherCat is used t controllers and to model the system Expandable behaviors for detecting logged in the fault simulation mode. enables effective training for system the event of malfunctions to be orga environment. In order to process the outcomes of effectively as possible, extensive cat provided. For device-independent di video or HTML5 container. 	odelling mechanisms , VRML and COLLADA mats nes based on model libraries and dels programming languages, amon ecution System MES4 for actic digital twin degrees of freedom son to basic topics LX (free registration required) Didactic learning systems such earning performance between terfaces such as PLCSIM e integrated STEP7 PLC control, s such as IRL or via external vanced -based interfaces such as UA or EZOPC our external hardware PLCs for oop) o connect external simulation behavior and correcting faults can be Evaluation of the outcomes atic commissioning and repairs nized in the simulation exercises and projects as mera paths and modes are splay, it is possible to export as	i s in	
		System requirements			



Customer No.		Project	Document No.	Date	Page
195586		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	26 / 33
Position	Quantity	 Description Intel Core i5 (7th generation) or equivalent 8 GB RAM, at least 200 GB HDD/SSD Windows 10 1709 64-bit or later Gimela media Intel UD 520 or bottom 			
		 Simple models: Intel HD 530 or better Complex models or for displaying large models i NVIDIA GeForce GTX 1070 or better CIROS supports OpenVR. A free Steam account is use the virtual reality feature 	n virtual reality: s required in order to		
		The purchase of a license provides the rights to continuously operate the version including two subsequent years of updates.			
		CIROS configuraton: CIR-DIG-STU-CPL 1x Ciros Studio 1x Ciros CP System model library			



Customer No.		Project	Document No.	Date	Page
195586		Worldskills Lyon 2024 – Single Workplace 125.132		17.03.2023	27 / 33
Position	Quantity	Description			
Pos. 20	1,00	Energy measurement box 8129208			
		The single-phase energy measurement box expands training far measuring the consumption of electrical energy and compress other variables such as currents, voltages, active and reactive processing the data and communicating via the network. In ad possibility for energetic analyses and optimizations, this provid for a continuous stream of live data from the production plant.	ctories by ed air as well as bower, dition to the les a data source		
		Up to three stations with single-phase electrical consumption a compressed air consumption can be evaluated in parallel per emeasurement box, e.g. three CP Lab belts each with 24 V powe energy measurement box can be placed both on the table and trolley, or hung in an A4 holder by removing the feet. Power is IEC C14 male connector.	is well as nergy r pack. The n a laboratory supplied via an	Pictur	e similar
		This means that the energy measurement box can be operated various training factory modules as well as at laboratory works consumption points simply by reconnecting. The single-phase measurement box includes the following components: Power measurement:	flexibly both at tations or other energy		
		 Siemens SENTRON PAC3220 power analyzer for 3 me 3x current transformer 35:1 3x IEC 60320-1 C13 socket, max. 10 A total 	asuring channels		
		Compressed air measurement:			
		 3x Festo SFAH IO-Link flow sensor 3x Festo SPAU IO-Link pressure sensor 3x In and 3x Out push-in connectors for 6 mm tubing 			
		Control and communication:			
		 Festo CPX-E PLC with IO-Link master, web server, OPC RJ45 LAN connection 	UA server		
		All constituents are state-of-the-art industrial components. Con the sensors is implemented via Modbus TCP and IO-Link, comr energy data management is provided via a documented OPC U Scope of delivery:	nmunication to nunication to the A interface.		
		 Single-phase energy measurement box 3x IEC connecting cable Network cable Connections, pneumatic Operating instructions with connection examples 			



Customer No.		Project	Document No.	Date	Page	
195586		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	28 / 33	
Position	Quantity	Description				
		Suitable for: Energy monitoring package for CP systems, software D35002, IOT Gateway	, including PC and			
		Type: Single-phase energy measurement box				
Pos. 21	1,00	FactoryViews Energy App			Reg Mary Rep in Array Advisor(A) A Stary	
		Energy monitoring is the basis for understanding, contro energy flows within a factory. The energy monitoring pac necessary software tools for communication, visualizatio	olling and optimizing ckage includes all on and analysis.			
		An OPC UA client periodically retrieves energy data from energy measuring box and stores them in an open Maria	Picture similar			
		The energy data can be visualized, evaluated and export various dashboards and it is possible to actively interve	ted as CSV data via ne in production.			
		The Monitoring dashboard offers a graphical visualization a real-time diagram and historical values. Limit values ca signal, and a notification is triggered if the limits are exc the Smart-Maintenance Option is available, a maintenan automatically.	on of all signals, both as an be defined for each eeded or undercut. If ace order can be created	I		
		The Analysis dashboard allows the graphical analysis of consumption of process steps, for example to quantify e measures.	the power and air nergy efficiency			
		The footprint dashboard visualizes the current consump environmental effects. Parameters such as electricity pri emissions can be configured.	tion with costs and ice and specific			
		The Factory dashboard allows to start and stop the CP Stop to monitor the total consumption, to reduce peak loads a energy-efficient operation.	ystems learning factory and to parameterize	,		
		In simulation mode, recorded data or random values car of real measurements.	າ be streamed instead			
		Learning contents:				
		 Industrial energy monitoring with OPC UA Power and compressed air consumption Energy efficiency measures Costs and carbon emissions Dashboard creation 				
		Scope of delivery:				
		 Energy App software, single license The dashboards can be accessed from multiple the local network. Connectivity to all signals of one Energy Measu 8129208 or 8130678) Workbook 	e web browsers within urement Box (model			



Customer No.		Project	Document No.	Date	Page				
195586		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	29 / 33				
Position	Quantity	Description							
Pos. 22	1,00	Wireless Access Point for CP System							
		D14203							
		TP-Link Archer C7 AC1750 Dual Band Gigabit WiFi Router (1300Mbps (5GHz) + 450Mbps (2.4GHz), 4 Gigabit LAN Ports, 1 USB 2.0, Print / Media / FTP Server, APP Control) Black							
		Accespoint is needed for CP System.							
Pos. 23	1,00	IOT GATEWAY		0	in any a				
		8172682			Presto				
		The IoT Gateway connects production level devices to the Industria Things (IIoT). It has a network connection for the device side, one f side and a hardware switch to control read and write authorization	al Internet of for the cloud 1.		Claud Device				
		The gateway offers a web interface with configuration options, incl	luding	Picture	e similar				
		 Network configuration including DHCP client NTP client for time synchronization Device management MQTT broker settings 							
		The gateway is able automatically to find known device types such Didactic energy measurement box in the network. The information the devices is stored in a signature file. After the devices have bee referred to as onboarding, the data is automatically retrieved cyclic forwarded to an MQTT broker.	as the Festo for pairing n paired, cally and						
		Your own signature files can be created and imported, meaning the device types can be found, coupled and read out via OPC UA.	at your own						
		The graphical development environment installed on the gateway, enables edge computing functionalities, i.e. data processing at the between the local network and the cloud.	Node-RED, boundary						
		A wide range of signal sources can be integrated using library elem the protocols OPC UA, Modbus TCP or REST API, signals can be pre using function blocks or JavaScript code, dashboards can be set up visualization and signals can be output to server services such as I or cloud services such as Siemens MindSphere or Microsoft Azure.	nents, e.g. via e-processed o for MQTT, MySQL						
		The gateway can be installed with the supplied accessories e.g. in carriage or on the NetLab EduTrainer and connected.	CP Lab						
		Scope of delivery:							
		 IoT Gateway Connection cable 24 VDC to 4 mm safety plug 2 x network cable & Mounting accessories Training documents with example scenario 							



Customer No.		Project	Document No.	Date	Page				
195586		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	30 / 33				
Position	Quantity	Description							
Pos. 24	1,00	TP 1333: networks and IT Security							
		8127829							
		Equipment set TP 1333: networks and IT Security	Picture similar						
		Equipment set TP 1333 contains components for the setup of example that serve to communicate all important fundamentals of IT security							
		• 2x EduTrainers with integrated electricity supply and one router and XC208 switch							
		1x Ethernet cable set							
		1x Festo NetLab Toolkit configuration software							
		 1x configuration files for the exercises with S615 router a switch 							
		• 1x workbook, in printed form and on a USB data carrier							
		The equipment is configured for two workstations. The individual modules can be adapted to the spatial situation in the classroom or laboratory. The modules can be positioned flexibly to solve the exercises: on worktables or in an A4 mounting frame. The two EduTrainers with Siemens router and switch form the core of equipment set TP 1333.							
		The enclosed Festo NetLab Toolkit (NLTK) configuration software enconfiguration of network and safety functions. Examples of such fur include setting an IP address, clearing the ARP address memory, a and deleting NetLab hierarchy certificates. The NLTK requires one- rights when launched, and makes the necessary functions available students. During the teaching unit, there is no further need to enter administrator password.	enables the unctions and importing off admin le to the er the	Ig					
		The enclosed workbook contains detailed practical exercises on ap that are becoming increasingly important in the industry. Theoretic foundations supplement the exercises perfectly. Pre-configured so setups and sample solutions optimize laboratory-based learning. I 4 can be carried out separately at one workstation. Exercises 5 and out jointly at neighboring workstations. The workbook covers the cyber security topics in everyday industrial situations:	oplications cal oftware Exercises 1 to d 6 are carried following key						
		 switching and monitoring address allocation in production networks routing and firewall functions VLAN-separated manufacturing networks Network Address Translation (NAT) Virtual Private Networks (VPN) 							
		For schools and training institutions in the commercial sector.							
		The end customer must confirm a license statement that the produce used for educational purposes. Festo provides the text on a form customer does not submit this statement, or fails to do so within a time, Festo is not obligated to deliver these goods.	act will only m. If the end a reasonable						
1	1	Llype: en							



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195586		Worldskills Lyon 2024 – Single Workplace	17.03.2023	31 / 33	
Position	Quantity	Description	·		
Pos. 25	1,00	Festo LX			101
		8133287			
				6 6 6	a mil
		Digital Learning Portal Festo LX – Voucher for 5 users for 1 year		-	
		Festo LX Basic Subscription		Pictur	e similar
		Festo IX is our Digital Learning Portal for individual Learning Exp	eriences. Our		
		cloud-based learning portal offers didactically prepared learning many technical areas.	content for		
		Festo LX is based on multimedia Learning Nuggets that can be co form individual Courses and Learning Paths. Courses can thus be easily and perfectly tailored to the individual needs of teachers a	mbined to adapted very nd learners.		
		Festo LX offers a mix of stand-alone courses and learning equipm courses to facilitate the hands-on experiments in technical fields, mapping of the courses with the hardware equipment so you can courses related to an equipment or the equipment required in a c	ent-based . Festo LX has a easily see the course.	1	
		Overview of content on Festo LX			
		On Festo LX, you will find a variety of learning content for many a technical education and professional qualification. From factory a and fluid power to IIoT and Industry 4.0, electrical engineering, p automation, renewable energies and STEM.	reas of automation rocess		
		Your license gives you access to more than:			
		• 250 eLab courses - digital, interactive courses to use in with our Festo Didactic learning systems	combination		
		• 70 eLearning courses to acquire theoretical knowledge need for any hardware	without the		
		 120 Evaluations for knowledge checks before or after a 80 courses and simulations for Connected Learning with lines EACET and Tec2Screen 	class h our product		
		 70 Short videos and user manuals 			
		 300 eBooks, which are PDF versions of workbooks for y systems 	our learning		
		Functional scope			
		With your Festo LX Basic subscription you will have access to a va LX Contents and the following features:	ariety of Festo		
		Course library to browse and filter all available courses	from Festo		
		• Easy creation and editing of individual courses with the	LX Creator		
		 User Management: organize individual learners and gro user permissions, assign specific contents 	oups, manage		



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195586		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	32 / 33
Position	Quantity	Description			
		 Tracking of learner's progress and success as well as exp learning results 	oort of		
		 Management and inventory of learning equipment 			
		 Availability of learning portal interface as well as content languages 	s in various		
		Mobile learning from various devices possible			
		Individualization of content			
		With the help of the LX Creator which is included in your license, it customize Festo Didactic courses according to your needs. You car custom content from scratch or integrate existing material into Fes can reuse content from Festo in your own courses to build your per individual learning contents.	is possible to n create to LX. You rsonal and		
		Content on Festo LX			
		Our Festo LX Basic Package supports, amongst others, the followir	ng topics:		
		Fluid Power:			
		Various courses for the field of pneumatics, electropneumatics, hy electrohydraulics and mobile hydraulics	draulics,		
		Electrical Engineering and Electric Power Technology:			
		Various courses for the field of electrical engineering/electronics, circuits, digital electronics, electric drive technology, motor contro mobility	electric power ls and e-		
		Factory and Process Automation:			
		Various courses for the field of mechatronics, sensors and smart so industrial control technology, micro controllers, PLC and fieldbus to robotics, process instrumentation and control, and water manager	ensors, echnology, nent		
		llot and Industry 4.0:			
		Various courses for the field of digitalization and networking, data MES and production planning, energy management and monitoring Intelligence, NX/MCD	security, g, Artificial		
		Sustainability:			
		Various courses for the field of energy efficiency, renewable energ generation, biologization	ies, power		
		Metal Working and Mechanics:			



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195586		Worldskills Lyon 2024 – Single Workplace	125.132	17.03.2023	33 / 33	
Position	Quantity	Description	Description			
		Various courses for the field of turning, milling, drilling, CNC machining, CAD, dimensional metrology. mechanical drives, piping, wiring				
		Organization and People: Various courses for the field of lean management, production processes and optimization as well as project management				
		Licensing and subscription duration				
		Your license allows you to add an unlimited number of learners to your organization. Content is accessible to the number of learners specified in the license. A license can be withdrawn from one user and assigned to another (transferable license based on course assignments).				
		The number of users and subscription duration of this license is specified below.				
		Once you activate your license in Festo LX, the subscription duration will start.				
		Licenses will not renew automatically.				
		Access for 5 users for one year.				

Remarks:

- Delivery according to availability
- Commissioning at site is not included. This could be ordered with 8155812.
- Technical training is not included. This could be ordered with 8155812.
- CIROS training is not included. We would recommend two days remotely. PN is 8155820.
- This offer is valid until June 2024.
- Warranty is 24 months as of day of acceptance/delivery.
- The conditions for offer, delivery, payment and software utilization printed in our current catalogue are valid. In case you do not have these, they can be obtained from your contact person. http://www.festo-didactic.com/int-en/agb