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Automation Technology

Acquire practical and project-oriented laboratory skills and expertise:

Automation trainers, mechatronics trainers, PLC trainers

IMS Industrial Mechatronics System – the New Generation

IMS Industrial Mechatronics System – the New Generation

With the "Industrial Mechatronics System" (IMS®) industrial automated production lines can be simulated in all their varying complexity. Thanks to its modular design IMS is a system which is perfectly suited for expansion. Consequently the system can be adapted to fit the needs of the students and can evolve to mirror their progress.

The new IMS generation excels due to the fact that the transport system features intelligent connection with a control system. The direct connection between the control system and the conveyor belt permits the system to go into operation quickly and easily.

- Having been exposed to industrial components used in the system trainees quickly adapt to real-life work after completing their training
- Realizing multi-phased training on only one system is also possible.
    - Gaining basic understanding thanks to operations with a microcontroller or LOGO!
    - Advanced training directly on the PLC of the transport system
    - In more advanced training it is possible to implement the networking of several transport systems with processing stations

- Small projects are carried out with single IMS components, especially when using the transport system or single stations
- Trainees are able to comprehend operating processes and signal state dependencies faster since they can read the I/O signal states directly on the system
- More complex exercises can be explored working with the IMS stations. Here additional functional interrelationships result from single IMS components interacting
- Since the systems are easily separated, there is a lot of room for creativity in customising lessons
- Complete and flexible production lines with a carousel system are set up by connecting the individual IMS stations. The multi-facetted projects are designed to develop solid know-how of the IMS stations.

Mechatronics Sub-Systems with Siemens PLC

Mechatronics Sub-Systems with Siemens PLC

All IMS sub-systems are composed of several individual IMS components. They can be connected to any programmable logic controller by means of standard connectors. Before IMS sub-systems are connected in larger installations, the requisite knowledge and skills should be learned with the aid of multi-media UniTrain-I courses.

- IMS sub-systems with Siemens S7 and experiment manuals: it is of course also possible to follow the conventional route and connect a sub-system to an industrial-type programmable logic controller and put it into operation.

Training objectives for sub-systems:

- Analysis of functional relationships
- Set-up and adjustment of sensors
- Introduction to electrical and pneumatic function modules
- Configuration of mechatronics sub-systems
- Investigation of the flow of energy and information
- PLC programming

IMS 1.5: DC transport system

IMS 1.5: DC transport system

The conveyor belt system is the element that connects all of the subsystems and thus forms the backbone of the entire production line. In the IMS® production line the conveyor belt systems are self-contained modules, which can be integrated with the sub-systems as needed. Basic processes like “positioning” and “speed” can be demonstrated with just this simple system.

Training objectives for DC transport system

- Principle and function of various sensors
- Making controlled movements on a single axis
- Incremental positioning of a workpiece carrier
- Disabling movement forwards or backwards
- Program for monitoring slip and whether a machine is stopped
- Safe handling of various safety circuits and locks.

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
1	**Cyber-physical Conveyor System**	LM9515	1
2	**IMS displacement measurement module**	LM9677	1
3	**Workpiece transport pallet**	LM9520	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
4	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	1

5	**USB 2.0 Ethernet adapter, 10/100**	LM8257	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
6	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
7	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
8	**Compressor, low-noise**	SE2902-9L	1
9	**Tubing and accessory set for mechatronics systems**	LM9670	1
10	**Set of Allen keys**	LM9716	1
11	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
12	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
13	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1

14	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

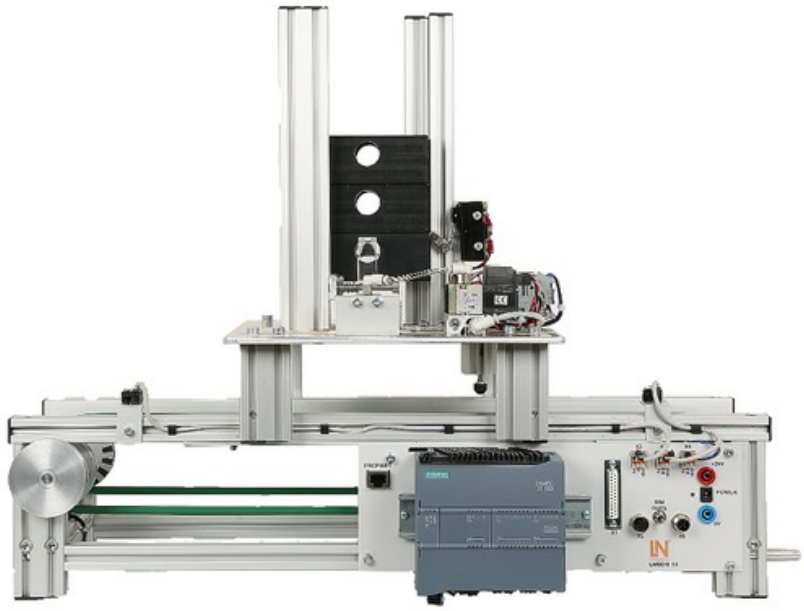
Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
15	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
16	**IMS/IPA test and fault simulator**	CO3713-7V	1
17	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
18	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS 3 Sorting



IMS 3 Sorting

A workpiece carrier is located on the conveyor belt. The carrier is positioned under the shaft for the gravity-feed magazine. The sorting station has a magazine that accommodates six bottom pieces. One piece is selected and placed in the carrier. The carrier and its load are then conveyed to the end of the belt to be passed on to the next sub-system.

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
19	**Sorting station**	LM9680	1
20	**Cyber-physical Conveyor System**	LM9515	1
21	**IMS displacement measurement module**	LM9677	1
22	**Workpiece transport pallet**	LM9520	1
23	**Workpiece, bottom section, white**	LM9524	2

Pos.	Product name	Bestell-Nr.	Anz.
24	**Workpiece, bottom section, black**	LM9525	2

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
25	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	1
26	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
27	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
28	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
29	**QuickChart, IMS 3 Mechatronics Sorting sub-system**	SO6200-1C	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
30	**Compressor, low-noise**	SE2902-9L	1
31	**Tubing and accessory set for mechatronics systems**	LM9670	1

32	**Set of Allen keys**	LM9716	1
33	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
34	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
35	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1
36	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

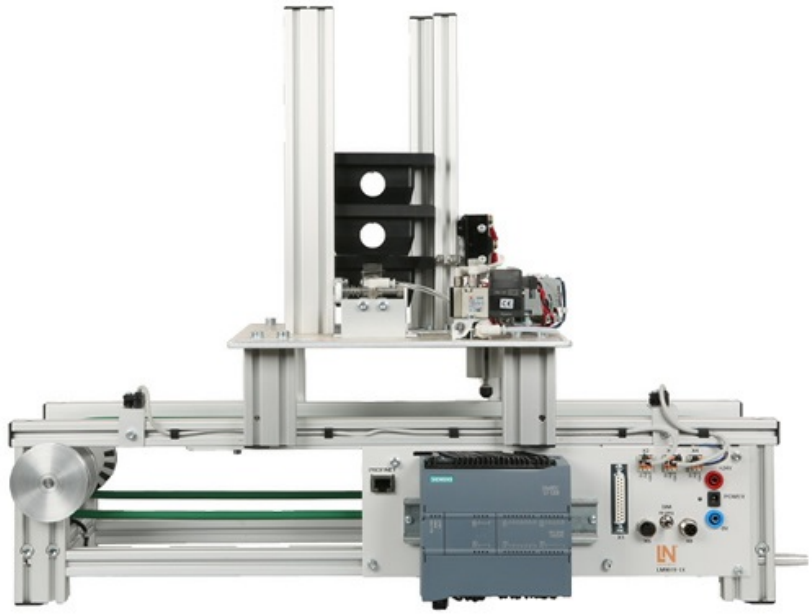
Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
37	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
38	**IMS/IPA test and fault simulator**	CO3713-7V	1
39	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
40	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS 4 Assembly



IMS 4 Assembly

A workpiece carrier is located on the conveyor belt. The carrier is positioned under the shaft for the gravity-feed magazine. The sorting station has a magazine that accommodates six top pieces. One piece is selected and placed in the carrier. The carrier and its load are then conveyed to the end of the belt to be passed on to the next sub-system.

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
41	**Assembly station**	LM9681	1
42	**Cyber-physical Conveyor System**	LM9515	1
43	**IMS displacement measurement module**	LM9677	1
44	**Workpiece transport pallet**	LM9520	1
45	**Workpiece, top section, white**	LM9521	2

46	**Workpiece, top section, black**	LM9522	2
47	**Workpiece, bottom section, white**	LM9524	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
48	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	1
49	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
50	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
51	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
52	**QuickChart, IMS 4 Mechatronics Assembly sub-system**	SO6200-1D	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
53	**Compressor, low-noise**	SE2902-9L	1

54	**Tubing and accessory set for mechatronics systems**	LM9670	1
55	**Set of Allen keys**	LM9716	1
56	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
57	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
58	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1
59	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

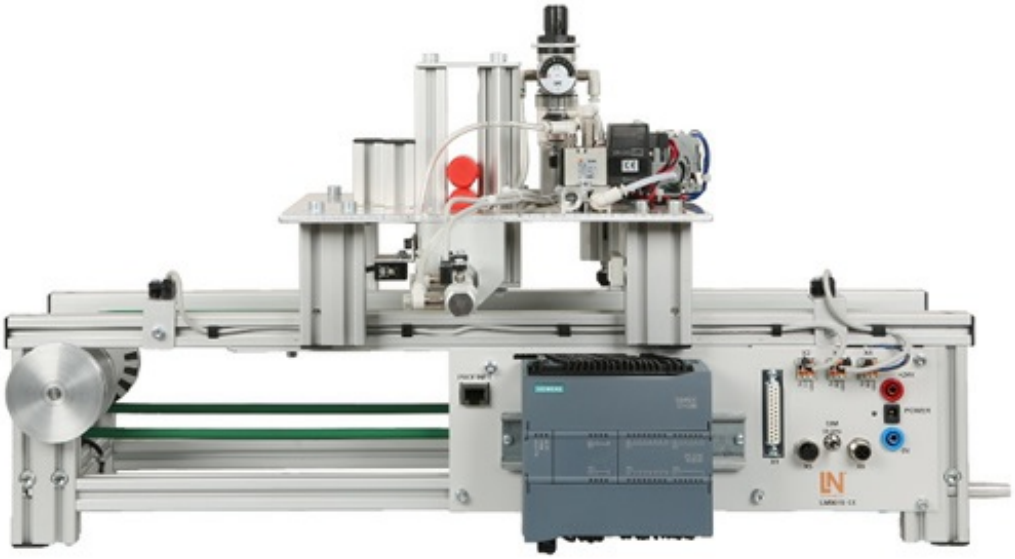
Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
60	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
61	**IMS/IPA test and fault simulator**	CO3713-7V	1
62	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
63	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS 5 Processing



IMS 5 Processing

A workpiece carrier is located on the conveyor belt. It is loaded with a fully assembled two-component workpiece (top and bottom pieces). The carrier and its load are positioned beneath the process module. The workpiece is clamped for processing. A bolt from the gravity-feed magazine is pressed into the hole in the workpiece. The clamp opens and the carrier and load are conveyed to the end of the belt to be passed on to the next sub-system.

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
64	**Processing station**	LM9682	1
65	**Cyber-physical Conveyor System**	LM9515	1
66	**IMS displacement measurement module**	LM9677	1
67	**Workpiece transport pallet**	LM9520	1
68	**Workpiece, top section, white**	LM9521	1
69	**Workpiece, bottom section, black**	LM9525	1

70	**Bolt workpiece, metal**	LM9527	3
71	**Bolt workpiece, plastic, red**	LM9528	3

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
72	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	1
73	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
74	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
75	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
76	**QuickChart, IMS 5 Mechatronics Process sub-system**	SO6200-1E	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
77	**Compressor, low-noise**	SE2902-9L	1

78	**Tubing and accessory set for mechatronics systems**	LM9670	1
79	**Set of Allen keys**	LM9716	1
80	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
81	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
82	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1
83	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
84	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
85	**IMS/IPA test and fault simulator**	CO3713-7V	1
86	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
87	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS 6 Testing

IMS 6 Testing

A carrier with a fully assembled workpiece is located on the conveyor belt. A stopper positions the piece alongside the sensors. The sensors detect the colour of the piece, its material and optionally its height. Test data will be saved for subsequent processes. After each successfully completed test the carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
88	**Testing station**	LM9684	1
89	**Cyber-physical Conveyor System**	LM9515	1
90	**IMS displacement measurement module**	LM9677	1
91	**Workpiece transport pallet**	LM9520	1
92	**Workpiece, top section, white**	LM9521	1
93	**Workpiece, top section, black**	LM9522	1
94	**Workpiece, bottom section, white**	LM9524	1

95	**Workpiece, bottom section, black**	LM9525	1
96	**Bolt workpiece, metal**	LM9527	1
97	**Bolt workpiece, plastic, red**	LM9528	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
98	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	1
99	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
100	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
101	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
102	**QuickChart, IMS 6 Mechatronics Testing sub-system**	SO6200-1F	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
103	**Compressor, low-noise**	SE2902-9L	1
104	**Tubing and accessory set for mechatronics systems**	LM9670	1
105	**Set of Allen keys**	LM9716	1
106	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
107	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
108	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1
109	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

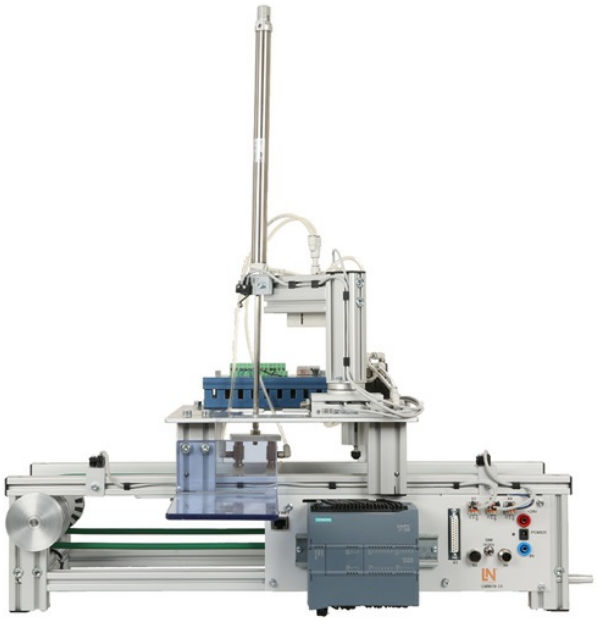
Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
110	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
111	**IMS/IPA test and fault simulator**	CO3713-7V	1
112	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
113	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS 7 Handling



IMS 7 Handling

A carrier with a fully assembled and tested workpiece is located on the conveyor belt. A handling station is located above the middle of the conveyor belt. The carrier is stopped at the removal position. The handling module lifts up the workpiece and transfers it to one of two possible positions. The empty carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
114	**Handling station**	LM9683	1
115	**Cyber-physical Conveyor System**	LM9515	1
116	**IMS displacement measurement module**	LM9677	1
117	**Workpiece transport pallet**	LM9520	1
118	**Workpiece, bottom section, white**	LM9524	1

119	**Workpiece, bottom section, black**	LM9525	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
120	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	1
121	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
122	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
123	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
124	**QuickChart, IMS 7 Mechatronics Handling sub-system**	SO6200-1G	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
125	**Compressor, low-noise**	SE2902-9L	1
126	**Tubing and accessory set for mechatronics systems**	LM9670	1

127	**Set of Allen keys**	LM9716	1
128	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
129	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
130	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1
131	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
132	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
133	**IMS/IPA test and fault simulator**	CO3713-7V	1
134	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
135	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS 8 Storage

IMS 8 Storage

A carrier with a fully assembled and tested workpiece is located on the conveyor belt. The carrier is stopped at the removal position. The handling module lifts up the workpiece and transfers it to one of twenty possible storage positions. The storage positions can be chosen according to the production task and test results. The empty carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
136	**High rack storage station with 20 storage cells**	LM9641	1
137	**Cyber-physical Conveyor System**	LM9515	1
138	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1
139	**IMS displacement measurement module**	LM9677	1
140	**Workpiece transport pallet**	LM9520	1

141	**Workpiece, top section, white**	LM9521	5
142	**Workpiece, top section, black**	LM9522	5
143	**Workpiece, bottom section, white**	LM9524	5
144	**Workpiece, bottom section, black**	LM9525	5

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
145	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	1
146	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	1
147	**Safety measurement cable (4mm), 100cm/40", blue**	SO5126-9A	1
148	**Safety measurement cable (4mm), 100cm/40", red**	SO5126-8U	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
149	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
150	**Interactive Lab Assistant: IMS 8 Storage station**	SO2800-5H	1
151	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1

152	**QuickChart, IMS 8 Mechatronics Storage sub-system**	SO6200-1H	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
153	**Compressor, low-noise**	SE2902-9L	1
154	**Tubing and accessory set for mechatronics systems**	LM9670	1
155	**Set of Allen keys**	LM9716	1
156	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
157	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
158	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1
159	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

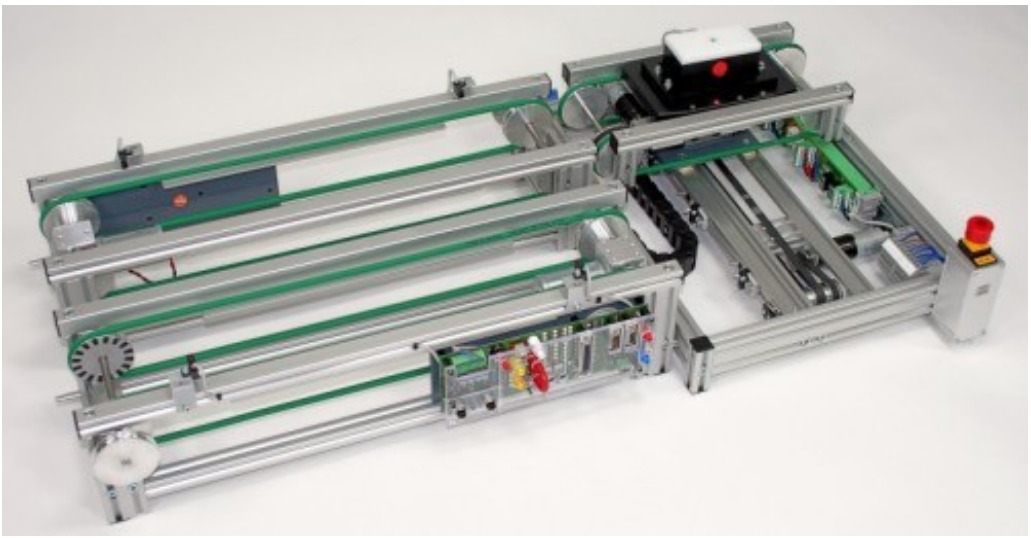
Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
160	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
161	**IMS/IPA test and fault simulator**	CO3713-7V	1
162	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
163	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS 9 Routing



IMS 9 Routing

A workpiece carrier is located on the conveyor belt. The routing unit receives the carrier and transfers it to a revolving transport unit. The revolving unit can determine the further routing of the carrier. The carrier can be picked up and passed on in any one of three positions.

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
164	**Routing station**	LM9614	1
165	**Cyber-physical Conveyor System**	LM9515	2

166	**Workpiece transport pallet**	LM9520	2

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
167	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	2
168	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
169	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
170	**Interactive Lab Assistant: IMS 9 Routing station**	SO2800-5J	1
171	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
172	**QuickChart, IMS 9 Mechatronics Routing sub-system**	SO6200-1J	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
173	**Compressor, low-noise**	SE2902-9L	1

174	**Tubing and accessory set for mechatronics systems**	LM9670	1
175	**Set of Allen keys**	LM9716	1
176	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
177	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
178	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1
179	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

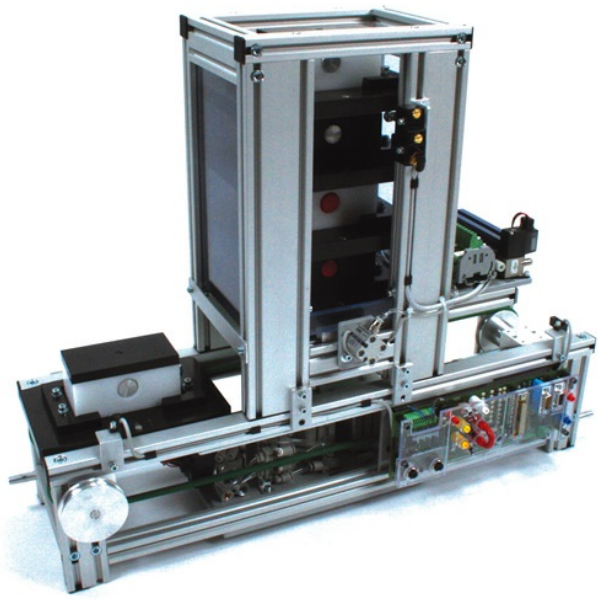
Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
180	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
181	**IMS/IPA test and fault simulator**	CO3713-7V	1
182	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
183	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS 10 Buffering



IMS 10 Buffering

The conveyor belt is equipped with two lifting units for buffering or queuing workpieces in complex mechatronics systems. The buffer controls the flow of materials. The carrier is lifted from the conveyor belt by a lifting unit and deposited in a magazine, while the belt continues moving with other pieces. Up to four laden or 10 unladen workpiece carriers can be held in store. The lifting unit can set the workpiece back onto the conveyor when necessary.

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
184	**Material buffering station**	LM9687	1
185	**Cyber-physical Conveyor System**	LM9515	1
186	**IMS displacement measurement module**	LM9677	1
187	**Workpiece transport pallet**	LM9520	3
188	**Workpiece, top section, white**	LM9521	1

189	**Workpiece, top section, black**	LM9522	1
190	**Workpiece, bottom section, white**	LM9524	1
191	**Workpiece, bottom section, black**	LM9525	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
192	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	1
193	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
194	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
195	**Interactive Lab Assistant: IMS 10 Buffering station**	SO2800-5K	1
196	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
197	**QuickChart, IMS 10 Mechatronics Buffering sub-system**	SO6200-1K	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer

with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
198	**Compressor, low-noise**	SE2902-9L	1
199	**Tubing and accessory set for mechatronics systems**	LM9670	1
200	**Set of Allen keys**	LM9716	1
201	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
202	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
203	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1
204	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

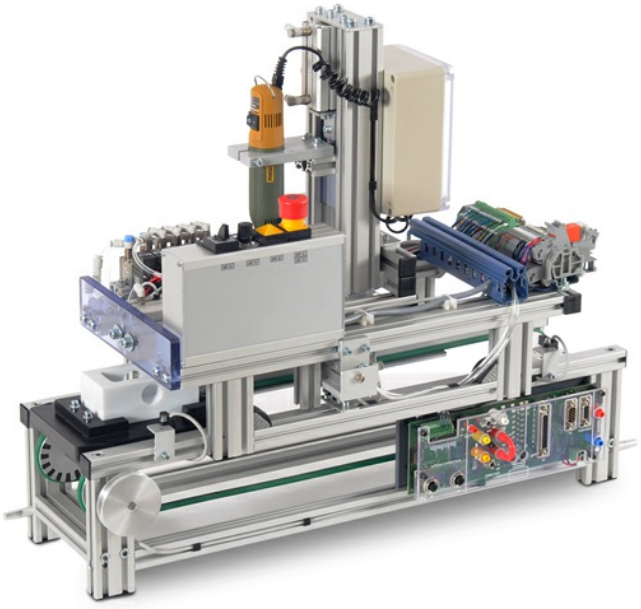
Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
205	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
206	**IMS/IPA test and fault simulator**	CO3713-7V	1
207	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
208	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS 13 Drilling and milling sub-system



IMS 13 Drilling and milling sub-system

A workpiece carrier with the bottom part of a workpiece is placed on the conveyor belt. The drilling and cutting station has a controllable cutting head which reams out the internal contour of the workpiece section. The cutting head can be moved in three axes in order to work on the component. Afterwards the workpiece carrier with its workpiece is moved to the end of the conveyor belt to be passed on to the next sub-system.

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
209	**Drilling and milling station**	LM9688	1
210	**Cyber-physical Conveyor System**	LM9515	1

211	**IMS displacement measurement module**	LM9677	1
212	**Workpiece transport pallet**	LM9520	1
213	**Workpiece, bottom section, white**	LM9524	1
214	**Workpiece, bottom section, black**	LM9525	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
215	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	1
216	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
217	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
218	**Interactive Lab Assistant: IMS 13 Drilling and milling station**	SO2800-5L	1
219	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
220	**QuickChart IMS13 - Drilling and milling station**	SO6200-1X	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer

with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
221	**Compressor, low-noise**	SE2902-9L	1
222	**Tubing and accessory set for mechatronics systems**	LM9670	1
223	**Set of Allen keys**	LM9716	1
224	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
225	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
226	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1
227	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
228	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
229	**IMS/IPA test and fault simulator**	CO3713-7V	1
230	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
231	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

CAC 1 Logo/controller for one IMS sub-system

CAC 1 Logo/controller for one IMS sub-system

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
232	**LOGO!8 board including LOGOsoft, DM8 modules, IP interface, 24 V,12 digital inputs, 4 analog inputs, 8 digital outputs**	CO3209-1U	1
233	**Adapter cable for IMS1.5 with memory card for S7-1200**	LM9697	1
234	**Cyber-physical Conveyor System**	LM9515	1
235	**IMS displacement measurement module**	LM9677	1
236	**Workpiece transport pallet**	LM9520	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
237	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	1

238	**Safety measurement cable (4mm), 50 cm, black, 600 V, CAT III ' 1000 V, CAT II / 32 A**	SO5126-8L	4

Media:

Pos.	Product name	Bestell-Nr.	Anz.
239	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
240	**Interactive Lab Assistant: CAC 1 Transportsystem über LOGO! steuern**	SO2805-4D	1
241	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
242	**QuickChart, Logo board, assembly and start-up**	SO6200-4A	1
243	**QuickChart, Logo board, safety instructions**	SO6200-4B	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
244	**Compressor, low-noise**	SE2902-9L	1
245	**Tubing and accessory set for mechatronics systems**	LM9670	1
246	**Set of Allen keys**	LM9716	1

247	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
248	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
249	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1
250	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
251	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
252	**IMS/IPA test and fault simulator**	CO3713-7V	1
253	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
254	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

CAC 2 Control of the Conveyor Belt via the Microcontroller

CAC 2 Control of the Conveyor Belt via the Microcontroller

Fundamentals of the "Cyber-physical system"

The smart factory (Industry 4.0) is based on the interaction between actuators and sensors, their integration in the Internet and the processing of all relevant information in a CPS platform. With the aid of the CPS trainer, the technicians of tomorrow can learn how to expand microcontroller systems into a cyber-physical system, and how to program this and use interfaces with the cloud to connect up the CPS platform.
Naturally, the CPS trainer can also be integrated as part of a smart factory system (Industry 4.0).

Your benefits:

- Connect the "smart" (microcontroller) with the "mechatronics" (conveyor belt) and sensors
- Process analog and digital input and output signals
- Do programming with the graphic programming language FlowCode
- Can be integrated into a smart factory
- Integration with Ethernet possible thanks to optional network module

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
255	**Course 8-bit Arduino UNO**	CO4205-7B	1
256	**Industrial Interface**	CO4205-7Z	1
257	**Cyber-physical Conveyor System**	LM9515	1

258	**IMS displacement measurement module**	LM9677	1
259	**Workpiece transport pallet**	LM9520	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
260	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	1
261	**Safety measurement cable (4mm), 150cm, red**	SO5126-9F	1
262	**Safety measurement cable (4mm), 150cm, blue**	SO5126-9K	1

Additionally required:

Pos.	Product name	Bestell-Nr.	Anz.
263	**UniTrain Interface with virtual instruments (basic VI)**	CO4203-2A	1
264	**ElоTrain Experimenter**	SO4203-3B	1
265	**ElоTrain set of connection cables and plugs for 2mm system**	SO5146-1N	1
266	**UniTrain storage case for one system**	CO4203-2Y	1
267	**Panel mounting frame for table, T-shaped base, 1 level**	ST8003-1V	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
268	**Interactive Lab Assistant: CAC 2 Transportsystem über Mikrocontroller steuern**	SO2805-4E	1
269	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
270	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1

Additionally recommended

In areas where there are high levels of humidity the membrane dryer with water trap should be used to avoid condensation:

Pos.	Product name	Bestell-Nr.	Anz.
271	**Compressor, low-noise**	SE2902-9L	1
272	**Tubing and accessory set for mechatronics systems**	LM9670	1
273	**Set of Allen keys**	LM9716	1
274	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
275	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1
276	**Protective cover for 1200mm wide IMS experiment trolleys with training panel**	ST8010-8L	1

277	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

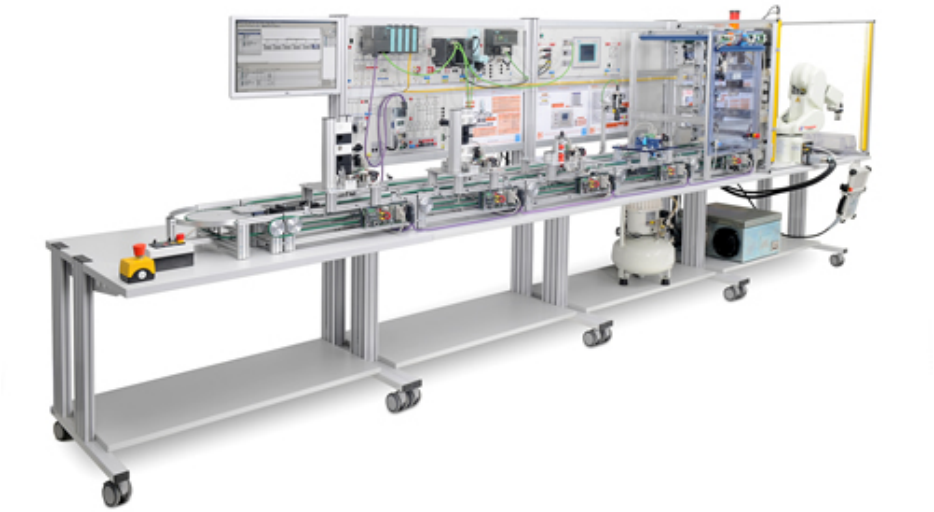
Optional Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
278	**Touch Panel KTP700 Basic Trainer Package**	CO3713-4Q	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
279	**IMS/IPA test and fault simulator**	CO3713-7V	1
280	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
281	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

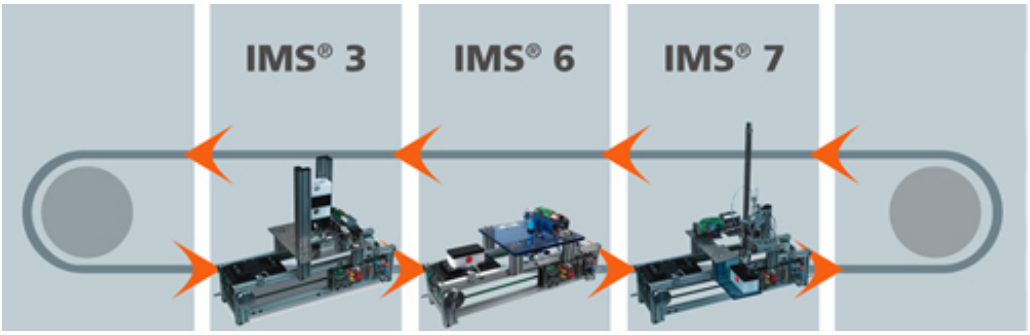
IMS 23-28 Examples of complete production installations (including controllers)



IMS 23-28 Examples of complete production installations (including controllers)

The Industrial Mechatronics System has a modular design that allows a wide variety of installations of any size to be designed, for any size of room and any budget. Typically these installations are logical assemblies of 3 to 8 sub-systems that can be supplemented by a carrier return system.

IMS 23 flexible manufacturing line with 3 stations



IMS 23 flexible manufacturing line with 3 stations

The production line system can be used for the fully automatic manufacture of a three-part workpiece of up to eight different end products. IMS 23 consists of the station sorting, testing and handling. All of the stations can be used individually or combined with each other in any given configuration. For the conveyance of workpieces between the individual sub systems a transport system with workpiece carriers is used on dual conveyor belt system.

Using this training system the industrial processes of a complex production line can be realistically simulated. Only industrial-type actuators and sensors are used. Also for system control only industrial type PLC systems with Profibus and decentralised periphery are deployed. Optional expansions of additional modern, industrial communications systems are planned. The system promotes the learning of skills and qualifications while in a team and enables students to work independently while acquiring the basics needed for mastering mechatronic systems.

Each sub-system is designed so that the student can acquire the necessary skills and knowledge step-by-step, starting with simple automation operations and sequences, and ending in development of complex automation programs. Standardized interfaces allow a use of various industrial PLC control units or the UniTrain-I system.

- Transport system: Dual conveyor belts with DC drive motors and a variable-speed, three-phase drive motor.
- Identification system: Three workpiece carriers are each furnished with a fixed code. A reading unit is mounted on the station.
- Identification system: An RFID identification system can be installed optionally.
- Supervisory level: Preparation of production orders on the control station PC; process visualization and operational-data acquisition
- Linkage of the process control station via TCP/IP
- IMS 3 sorting station
- IMS 6 testing station
- IMS 7 handling station

IMS 1.5: Cyber physical transport system

IMS 1.5: Cyber physical transport system

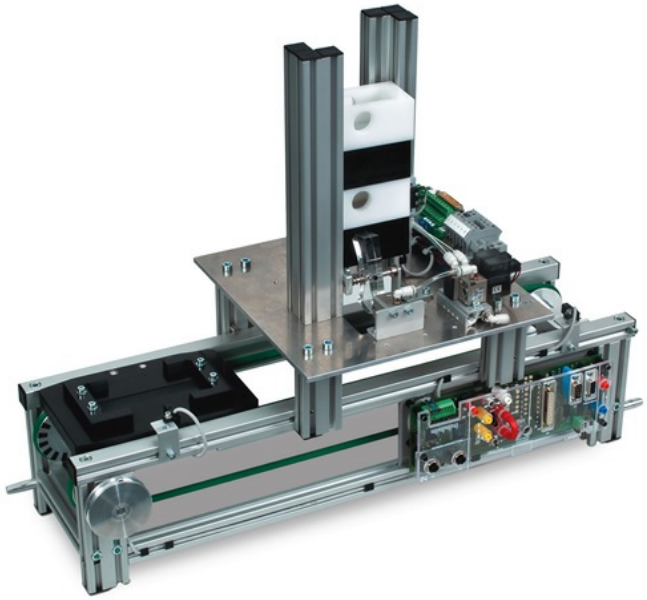
The conveyor belt system is the element that connects all of the subsystems and thus forms the backbone of the entire production line. In the IMS® production line the conveyor belt systems are self-contained modules, which can be integrated with the sub-systems as needed. Basic processes like “positioning” and “speed” can be demonstrated with just this simple system.

Training objectives for DC transport system

- Principle and function of various sensors
- Making controlled movements on a single axis
- Incremental positioning of a workpiece carrier
- Disabling movement forwards or backwards
- Program for monitoring slip and whether a machine is stopped
- Safe handling of various safety circuits and locks.

Pos.	Product name	Bestell-Nr.	Anz.
282	**Cyber-physical Conveyor System**	LM9515	4
283	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	4

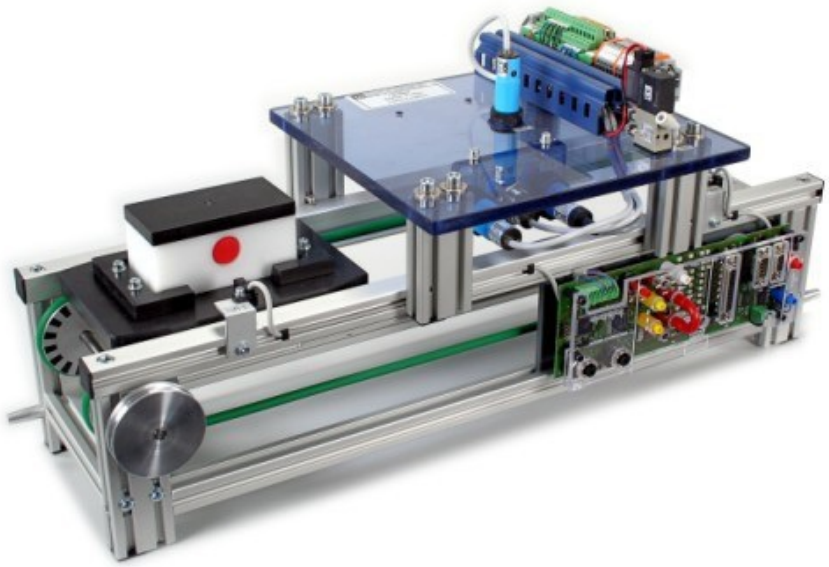
IMS 3 Sorting



IMS 3 Sorting

A workpiece carrier is located on the conveyor belt. The carrier is positioned under the shaft for the gravity-feed magazine. The sorting station has a magazine that accommodates six bottom pieces. One piece is selected and placed in the carrier. The carrier and its load are then conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
284	**Sorting station**	LM9680	1

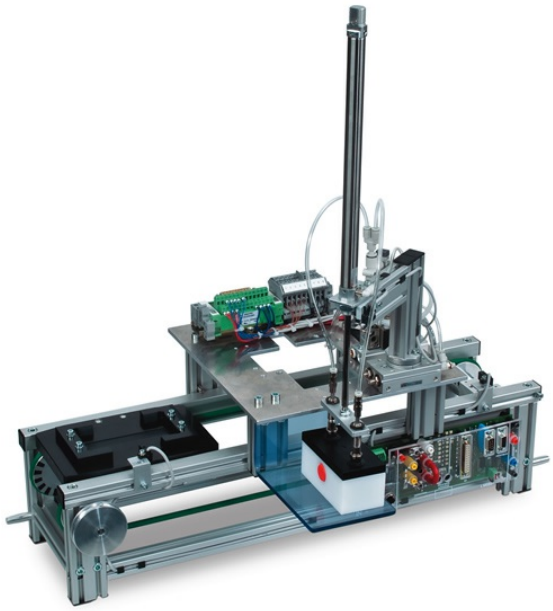


IMS 6 Testing

A carrier with a fully assembled workpiece is located on the conveyor belt. A stopper positions the piece alongside the sensors. The sensors detect the colour of the piece, its material and optionally its height. Test data will be saved for subsequent processes. After each successfully completed test the carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
285	**Testing station**	LM9684	1

IMS 7 Handling



IMS 7 Handling

A carrier with a fully assembled and tested workpiece is located on the conveyor belt. A handling station is located above the middle of the conveyor belt. The carrier is stopped at the removal position. The handling module lifts up the workpiece and transfers it to one of two possible positions. The empty carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
286	**Handling station**	LM9683	1

S7-1500 PLC control system with accessories:

Pos.	Product name	Bestell-Nr.	Anz.
287	**SIMATIC S7-1516-3 PN/DP 32 DE, 32 DA, 8 AE, 4 AA, 24V / 6 A power supply**	CO3713-8R	1
288	**Touch panel TP700 Comfort Trainer Package**	CO3713-4P	1
289	**Safety connecting plug 4mm with tap (2x), red, 1000V/32A CAT II**	SO5126-3U	1

290	**Safety connecting plug 4mm with tap (2x), blue, 1000V/32A CAT II**	SO5126-3V	1
291	**Safety measurement cable (4mm), 100cm/40", blue**	SO5126-9A	1
292	**Safety measurement cable (4mm), 100cm/40", red**	SO5126-8U	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
293	**Double conveyor belt segment, passive**	LM9603	2
294	**180° conveyor belt segment**	LM9611	2
295	**Workpiece transport pallet**	LM9520	3
296	**IMS manual control unit**	LM9638	1
297	**Workpiece, bottom section, white**	LM9524	2
298	**Workpiece, bottom section, black**	LM9525	2
299	**Compressor, low-noise**	SE2902-9L	1
300	**Tubing and accessory set for mechatronics systems**	LM9670	1
301	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	3
302	**Initial programming and calibration setup of IMS23 before leaving the factory**	LA9523	1

303	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
304	**IMS/IPA test and fault simulator**	CO3713-7V	1
305	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
306	**Safety measurement cable (4mm), 100cm/40", blue**	SO5126-9A	1
307	**Safety measurement cable (4mm), 100cm/40", red**	SO5126-8U	1
308	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS furniture

IMS furniture

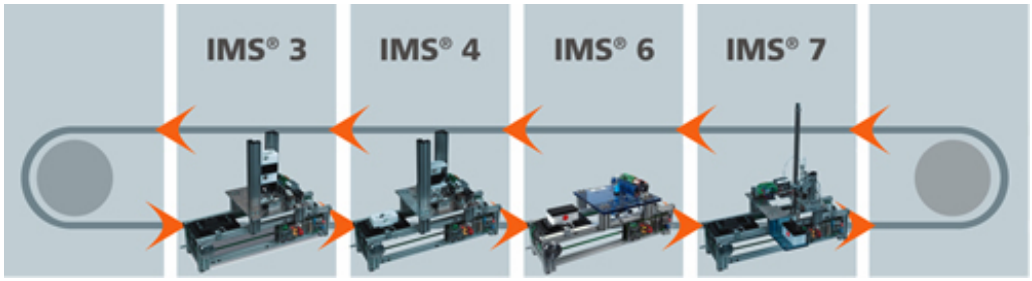
The IMS furniture system is used together with the Industrial Mechatronics System. The mobile trolleys can be used for individual components or sub-systems. In order to build complex, mechatronics systems, the trolleys can be lined up alongside one another and can be supplemented by frames to accommodate training panels. A power console allows the trolley to be equipped with a wide variety of 3 HU modules. The trolleys can be extended by means of various add-ons attachable to the aluminium rails to make up a multi-function PC experiment trolley.

Pos.	Product name	Bestell-Nr.	Anz.
309	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
310	**SybaPro mobile IMS experiment trolley, 1200mm**	ST7200-3U	2
311	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
312	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
313	**Interactive Lab Assistant: Production line with 3 stations**	SO2800-5P	1
314	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
315	**QuickChart, IMS 3 Mechatronics Sorting sub-system**	SO6200-1C	1
316	**QuickChart, IMS 6 Mechatronics Testing sub-system**	SO6200-1F	1
317	**QuickChart, IMS 7 Mechatronics Handling sub-system**	SO6200-1G	1
318	**QuickChart, IMS 23 Production line with 3 stations**	SO6200-1P	1
319	**QuickChart IMS Manual operating device**	SO6200-1V	1

IMS 24 flexible manufacturing line with 4 stations



IMS 24 flexible manufacturing line with 4 stations

This facility can be used for fully automated manufacture of a 3-part workpiece (up to eight different final products being permissible). IMS 24 comprises stations for sorting, assembly, testing and handling. All sub stations can be used individually or combined as required. Carriers on dual conveyor belts are used to transport workpieces between the individual sub-systems.

Making exclusive use of actuators and sensors found typically in industrial applications, this training facility permits realistic simulations of complex, continuous industrial production processes. The facility is also controlled by PLC systems commonly used in the industry and incorporating a process-field bus as well as decentralized peripherals. Optional extensions comprising modern, industrial communication systems are provided for. Promoting an acquisition of skills as part of teamwork, the system enables students to independently gain a basic understanding of mechatronic systems.

Each sub-system is designed so that the student can acquire the necessary skills and knowledge step-by-step, starting with simple automation operations and sequences, and ending in development of complex automation programs. Standardized interfaces allow a use of various industrial PLC control units or the UniTrain-I system.

- Transport system: Dual conveyor belts with DC drive motors and a variable-speed, three-phase drive motor.
- Identification system: Four workpiece carriers are each furnished with a fixed code. A reading unit is mounted on each station.
- Identification system: An RFID identification system can be installed optionally.
- Supervisory level: Preparation of production orders on the control station PC; process visualization and operational-data acquisition
- Linkage of the process control station via TCP/IP
- IMS 3 sorting station
- IMS 4 assembly station
- IMS 6 testing station
- IMS 7 handling station

IMS 1.5: Cyber physical transport system

IMS 1.5: Cyber physical transport system

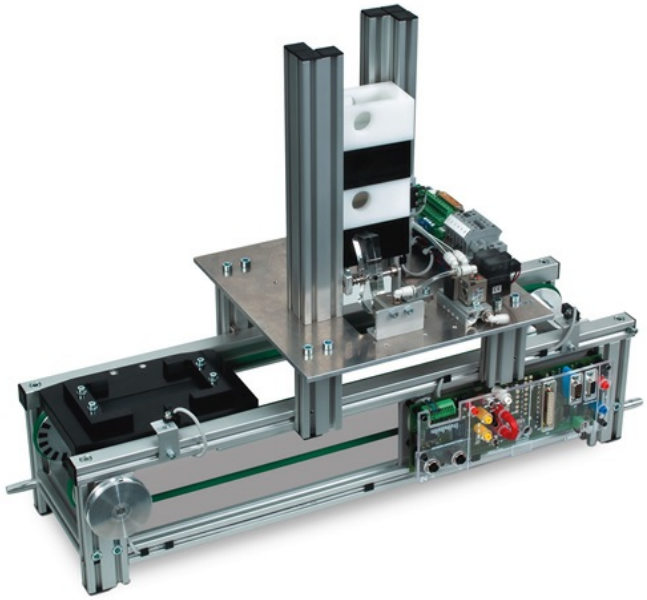
The conveyor belt system is the element that connects all of the subsystems and thus forms the backbone of the entire production line. In the IMS® production line the conveyor belt systems are self-contained modules, which can be integrated with the sub-systems as needed. Basic processes like “positioning” and “speed” can be demonstrated with just this simple system.

Training objectives for DC transport system

- Principle and function of various sensors
- Making controlled movements on a single axis
- Incremental positioning of a workpiece carrier
- Disabling movement forwards or backwards
- Program for monitoring slip and whether a machine is stopped
- Safe handling of various safety circuits and locks.

Pos.	Product name	Bestell-Nr.	Anz.
320	**Cyber-physical Conveyor System**	LM9515	6
321	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	6

IMS 3 Sorting

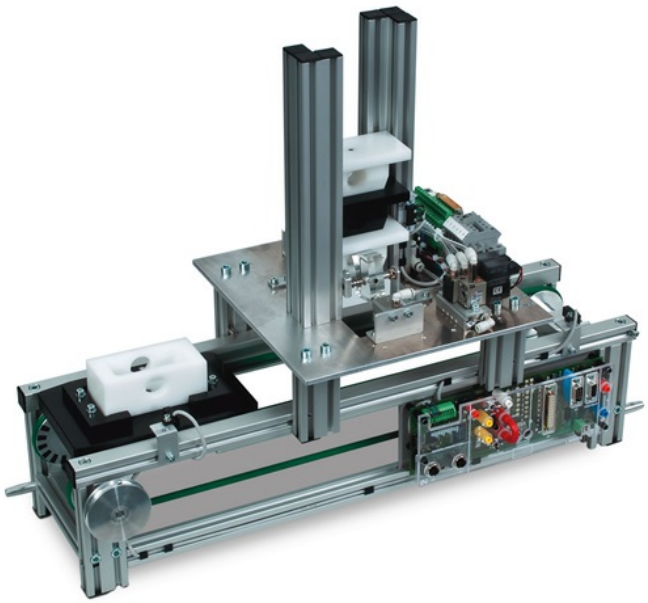


IMS 3 Sorting

A workpiece carrier is located on the conveyor belt. The carrier is positioned under the shaft for the gravity-feed magazine. The sorting station has a magazine that accommodates six bottom pieces. One piece is selected and placed in the carrier. The carrier and its load are then conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
322	**Sorting station**	LM9680	1

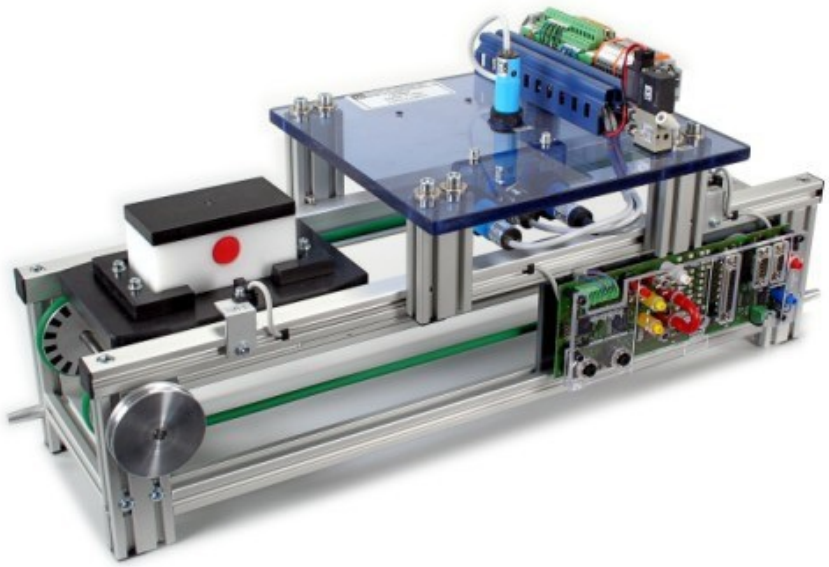
IMS 4 Assembly



IMS 4 Assembly

A workpiece carrier is located on the conveyor belt. The carrier is positioned under the shaft for the gravity-feed magazine. The sorting station has a magazine that accommodates six top pieces. One piece is selected and placed in the carrier. The carrier and its load are then conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
323	**Assembly station**	LM9681	1

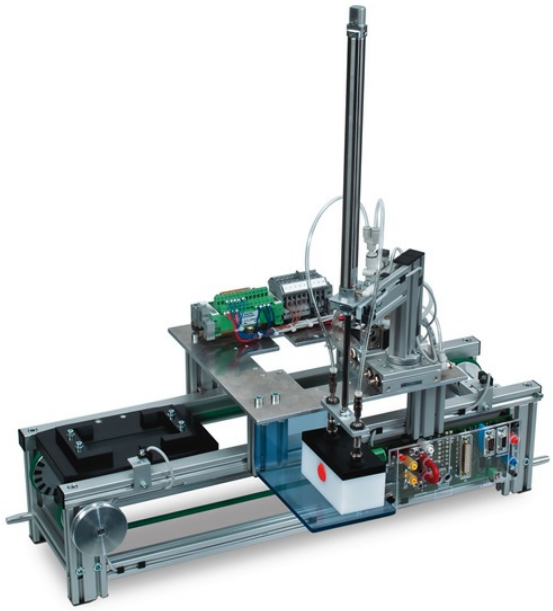


IMS 6 Testing

A carrier with a fully assembled workpiece is located on the conveyor belt. A stopper positions the piece alongside the sensors. The sensors detect the colour of the piece, its material and optionally its height. Test data will be saved for subsequent processes. After each successfully completed test the carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
324	**Testing station**	LM9684	1

IMS 7 Handling



IMS 7 Handling

A carrier with a fully assembled and tested workpiece is located on the conveyor belt. A handling station is located above the middle of the conveyor belt. The carrier is stopped at the removal position. The handling module lifts up the workpiece and transfers it to one of two possible positions. The empty carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
325	**Handling station**	LM9683	1

S7-1500 PLC control system with accessories:

Pos.	Product name	Bestell-Nr.	Anz.
326	**SIMATIC S7-1516-3 PN/DP 32 DE, 32 DA, 8 AE, 4 AA, 24V / 6 A power supply**	CO3713-8R	1
327	**Touch panel TP700 Comfort Trainer Package**	CO3713-4P	1
328	**Safety connecting plug 4mm with tap (2x), red, 1000V/32A CAT II**	SO5126-3U	1

329	**Safety connecting plug 4mm with tap (2x), blue, 1000V/32A CAT II**	SO5126-3V	1
330	**Safety measurement cable (4mm), 100cm/40", blue**	SO5126-9A	1
331	**Safety measurement cable (4mm), 100cm/40", red**	SO5126-8U	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
332	**Double conveyor belt segment, passive**	LM9603	2
333	**180° conveyor belt segment**	LM9611	2
334	**Workpiece transport pallet**	LM9520	4
335	**Workpiece, top section, white**	LM9521	2
336	**Workpiece, top section, black**	LM9522	2
337	**Workpiece, bottom section, white**	LM9524	2
338	**Workpiece, bottom section, black**	LM9525	2
339	**IMS manual control unit**	LM9638	1
340	**Compressor, low-noise**	SE2902-9L	1
341	**Tubing and accessory set for mechatronics systems**	LM9670	1
342	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	4

343	**Initial programming and calibration setup of IMS24 before leaving the factory**	LA9524	1
344	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
345	**IMS/IPA test and fault simulator**	CO3713-7V	1
346	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
347	**Safety measurement cable (4mm), 100cm/40", blue**	SO5126-9A	1
348	**Safety measurement cable (4mm), 100cm/40", red**	SO5126-8U	1
349	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS furniture

IMS furniture

The IMS furniture system is used together with the Industrial Mechatronics System. The mobile trolleys can be used for individual components or sub-systems. In order to build complex, mechatronics systems, the trolleys can be lined up alongside one another and can be supplemented by frames to accommodate training panels. A power console allows the trolley to be equipped with a wide variety of 3 HU modules. The trolleys can be extended by means of various add-ons attachable to the aluminium rails to make up a multi-function PC experiment trolley.

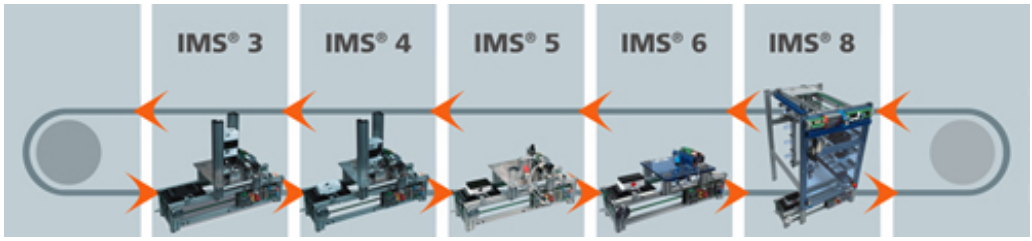
Pos.	Product name	Bestell-Nr.	Anz.
350	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
351	**SybaPro mobile IMS experiment trolley, 1200mm**	ST7200-3U	2

352	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
353	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
354	**Interactive Lab Assistant: Production line with 4 stations**	SO2800-5Q	1
355	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
356	**QuickChart, IMS 3 Mechatronics Sorting sub-system**	SO6200-1C	1
357	**QuickChart, IMS 4 Mechatronics Assembly sub-system**	SO6200-1D	1
358	**QuickChart, IMS 6 Mechatronics Testing sub-system**	SO6200-1F	1
359	**QuickChart, IMS 7 Mechatronics Handling sub-system**	SO6200-1G	1
360	**QuickChart, IMS 24 Production line with 4 stations**	SO6200-1Q	1
361	**QuickChart IMS Manual operating device**	SO6200-1V	1

IMS 25 flexible manufacturing line with 5 stations



IMS 25 flexible manufacturing line with 5 stations

This facility can be used for fully automated manufacture of a 3-part workpiece (up to eight different final products being permissible). IMS 25 comprises stations for sorting, assembly, processing, testing and storage. All stations can be used individually or combined as required. Carriers on dual conveyor belts are used to transport workpieces between the individual sub-systems.

Making exclusive use of actuators and sensors found typically in industrial applications, this training facility permits realistic simulations of complex, continuous industrial production processes. The facility is also controlled by PLC systems commonly used in the industry and incorporating a process-field bus as well as decentralized peripherals. Optional extensions comprising modern, industrial communication systems are provided for. Promoting an acquisition of skills as part of teamwork, the system enables students to independently gain a basic understanding of mechatronic systems.

Each sub-system is designed so that the student can acquire the necessary skills and knowledge step-by-step, starting with simple automation operations and sequences, and ending in development of complex automation programs. Standardized interfaces allow a use of various industrial PLC control units or the UniTrain-I system.

- Transport system: Dual conveyor belts with DC drive motors and a variable-speed, three-phase drive motor.
- Identification system: Five workpiece carriers are each furnished with a fixed code. A reading unit is mounted on each station.
- Identification system: An RFID identification system can be installed optionally.
- Supervisory level: Preparation of production orders on the control station PC; process visualization and operational-data acquisition
- Linkage of the process control station via TCP/IP
- IMS 3 sorting station
- IMS 4 assembly station
- IMS 5 processing station
- IMS 6 testing station
- IMS 8 storage station

IMS 1.5: Cyber physical transport system

IMS 1.5: Cyber physical transport system

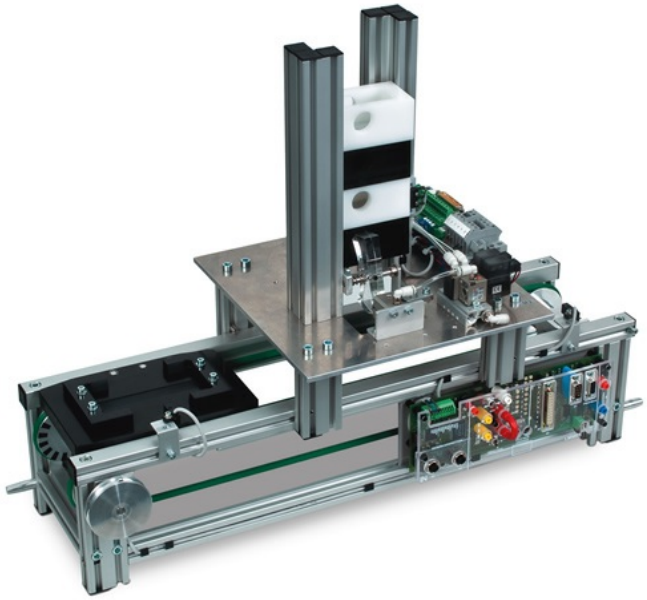
The conveyor belt system is the element that connects all of the subsystems and thus forms the backbone of the entire production line. In the IMS® production line the conveyor belt systems are self-contained modules, which can be integrated with the sub-systems as needed. Basic processes like “positioning” and “speed” can be demonstrated with just this simple system.

Training objectives for DC transport system

- Principle and function of various sensors
- Making controlled movements on a single axis
- Incremental positioning of a workpiece carrier
- Disabling movement forwards or backwards
- Program for monitoring slip and whether a machine is stopped
- Safe handling of various safety circuits and locks.

Pos.	Product name	Bestell-Nr.	Anz.
362	**Cyber-physical Conveyor System**	LM9515	7
363	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	7

IMS 3 Sorting

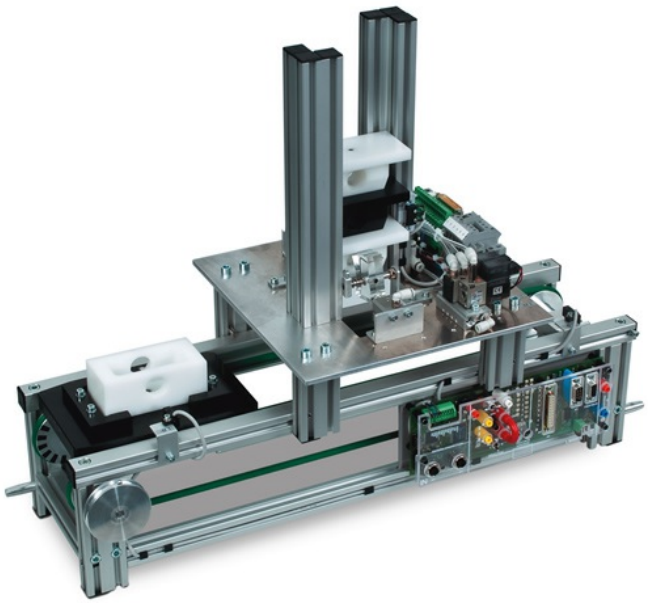


IMS 3 Sorting

A workpiece carrier is located on the conveyor belt. The carrier is positioned under the shaft for the gravity-feed magazine. The sorting station has a magazine that accommodates six bottom pieces. One piece is selected and placed in the carrier. The carrier and its load are then conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
364	**Sorting station**	LM9680	1

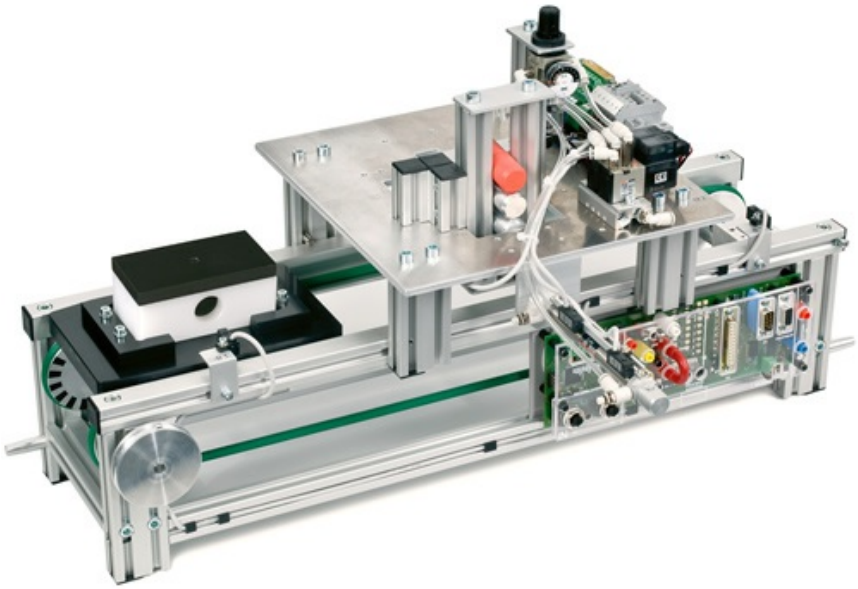
IMS 4 Assembly



IMS 4 Assembly

A workpiece carrier is located on the conveyor belt. The carrier is positioned under the shaft for the gravity-feed magazine. The sorting station has a magazine that accommodates six top pieces. One piece is selected and placed in the carrier. The carrier and its load are then conveyed to the end of the belt to be passed on to the next sub-system.

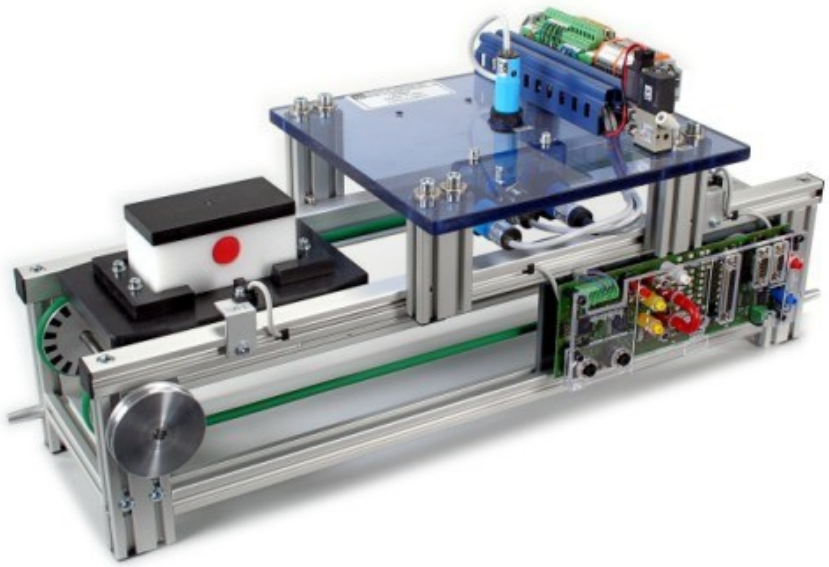
Pos.	Product name	Bestell-Nr.	Anz.
365	**Assembly station**	LM9681	1



IMS 5 Processing

A workpiece carrier is located on the conveyor belt. It is loaded with a fully assembled two-component workpiece (top and bottom pieces). The carrier and its load are positioned beneath the process module. The workpiece is clamped for processing. A bolt from the gravity-feed magazine is pressed into the hole in the workpiece. The clamp opens and the carrier and load are conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
366	**Processing station**	LM9682	1



IMS 6 Testing

A carrier with a fully assembled workpiece is located on the conveyor belt. A stopper positions the piece alongside the sensors. The sensors detect the colour of the piece, its material and optionally its height. Test data will be saved for subsequent processes. After each successfully completed test the carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
367	**Testing station**	LM9684	1

IMS 8 Storage

IMS 8 Storage

A carrier with a fully assembled and tested workpiece is located on the conveyor belt. The carrier is stopped at the removal position. The handling module lifts up the workpiece and transfers it to one of twenty possible storage positions. The storage positions can be chosen according to the production task and test results. The empty carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
368	**High rack storage station with 20 storage cells**	LM9641	1

S7-1500 PLC control system with accessories:

Pos.	Product name	Bestell-Nr.	Anz.
369	**SIMATIC S7-1516-3 PN/DP 32 DE, 32 DA, 8 AE, 4 AA, 24V / 6 A power supply**	CO3713-8R	1
370	**Touch panel TP700 Comfort Trainer Package**	CO3713-4P	1
371	**Safety connecting plug 4mm with tap (2x), red, 1000V/32A CAT II**	SO5126-3U	1

372	**Safety connecting plug 4mm with tap (2x), blue, 1000V/32A CAT II**	SO5126-3V	1
373	**Safety measurement cable (4mm), 100cm/40", blue**	SO5126-9A	1
374	**Safety measurement cable (4mm), 100cm/40", red**	SO5126-8U	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
375	**Double conveyor belt segment, passive**	LM9603	3
376	**180° conveyor belt segment**	LM9611	2
377	**Workpiece transport pallet**	LM9520	5
378	**Workpiece, top section, white**	LM9521	5
379	**Workpiece, top section, black**	LM9522	5
380	**Workpiece, bottom section, white**	LM9524	5
381	**Workpiece, bottom section, black**	LM9525	5
382	**Bolt workpiece, metal**	LM9527	5
383	**Bolt workpiece, plastic, red**	LM9528	5
384	**IMS manual control unit**	LM9638	1
385	**Compressor, low-noise**	SE2902-9L	1

386	**Tubing and accessory set for mechatronics systems**	LM9670	1
387	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	5
388	**Initial programming and calibration setup of IMS25 before leaving the factory**	LA9525	1
389	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
390	**IMS/IPA test and fault simulator**	CO3713-7V	1
391	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
392	**Safety measurement cable (4mm), 100cm/40", blue**	SO5126-9A	1
393	**Safety measurement cable (4mm), 100cm/40", red**	SO5126-8U	1
394	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS furniture

IMS furniture

The IMS furniture system is used together with the Industrial Mechatronics System. The mobile trolleys can be used for individual components or sub-systems. In order to build complex, mechatronics systems, the trolleys can be lined up alongside one another and can be supplemented by frames to accommodate training panels. A power console allows the trolley to be equipped with a wide variety of 3 HU modules. The trolleys can be extended by means of various add-ons attachable to the aluminium rails to make up a multi-function PC experiment trolley.

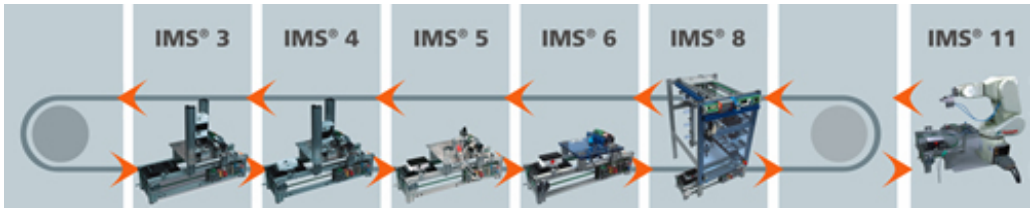
Pos.	Product name	Bestell-Nr.	Anz.
395	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	1
396	**SybaPro mobile IMS experiment trolley, 1200mm**	ST7200-3U	3
397	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
398	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
399	**Interactive Lab Assistant: Production line with 5 stations**	SO2800-5R	1
400	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
401	**QuickChart, IMS 3 Mechatronics Sorting sub-system**	SO6200-1C	1
402	**QuickChart, IMS 4 Mechatronics Assembly sub-system**	SO6200-1D	1

403	**QuickChart, IMS 5 Mechatronics Process sub-system**	SO6200-1E	1
404	**QuickChart, IMS 6 Mechatronics Testing sub-system**	SO6200-1F	1
405	**QuickChart, IMS 8 Mechatronics Storage sub-system**	SO6200-1H	1
406	**QuickChart, IMS 25 Production line with 5 stations**	SO6200-1R	1
407	**QuickChart IMS Manual operating device**	SO6200-1V	1

IMS 26 flexible manufacturing line with 6 stations



IMS 26 flexible manufacturing line with 6 stations

This facility can be used for fully automated manufacture of a 3-part workpiece (up to eight different final products being permissible). IMS 26 comprises stations for sorting, assembly, processing, testing, storage and dis-assembly. All stations can be used individually or combined as required. Carriers on dual conveyor belts are used to transport workpieces between the individual sub-systems.

Making exclusive use of actuators and sensors found typically in industrial applications, this training facility permits realistic simulations of complex, continuous industrial production processes. The facility is also controlled by PLC systems commonly used in the industry and incorporating a process-field bus as well as decentralized peripherals. Optional extensions comprising modern, industrial communication systems are provided for. Promoting an acquisition of skills as part of teamwork, the system enables students to independently gain a basic understanding of mechatronic systems.

Each sub-system is designed so that the student can acquire the necessary skills and knowledge step-by-step, starting with simple automation operations and sequences, and ending in development of complex automation programs. Standardized interfaces allow a use of various industrial PLC control units or the UniTrain-I system.

- Transport system: Dual conveyor belts with DC drive motors and a variable-speed, three-phase drive motor.
- Identification system: Six workpiece carriers are each furnished with a fixed code. A reading unit is mounted on each station.
- Identification system: An RFID identification system can be installed optionally.
- Supervisory level: Preparation of production orders on the control station PC; process visualization and operational-data acquisition
- Linkage of the process control station via TCP/IP
- IMS 3 sorting station
- IMS 4 assembly station
- IMS 5 processing station
- IMS 6 testing station
- IMS 8 storage station
- IMS 11 dis-assembly station

IMS 1.5: Cyber physical transport system

IMS 1.5: Cyber physical transport system

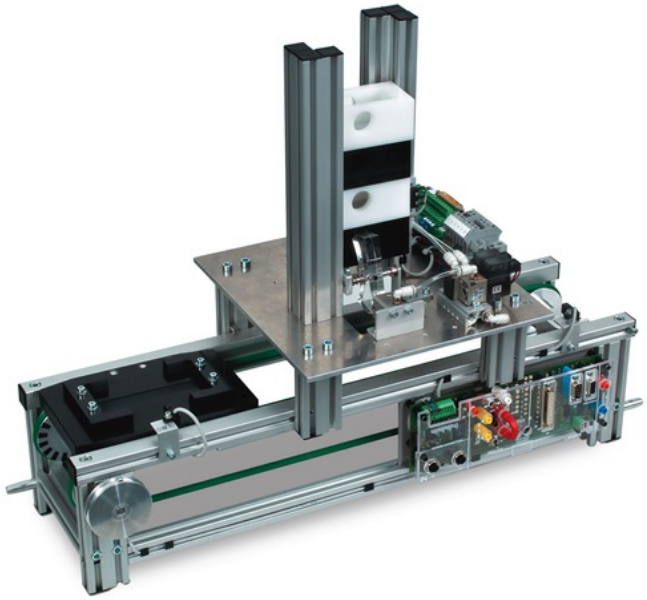
The conveyor belt system is the element that connects all of the subsystems and thus forms the backbone of the entire production line. In the IMS® production line the conveyor belt systems are self-contained modules, which can be integrated with the sub-systems as needed. Basic processes like “positioning” and “speed” can be demonstrated with just this simple system.

Training objectives for DC transport system

- Principle and function of various sensors
- Making controlled movements on a single axis
- Incremental positioning of a workpiece carrier
- Disabling movement forwards or backwards
- Program for monitoring slip and whether a machine is stopped
- Safe handling of various safety circuits and locks.

Pos.	Product name	Bestell-Nr.	Anz.
408	**Cyber-physical Conveyor System**	LM9515	7
409	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	7

IMS 3 Sorting

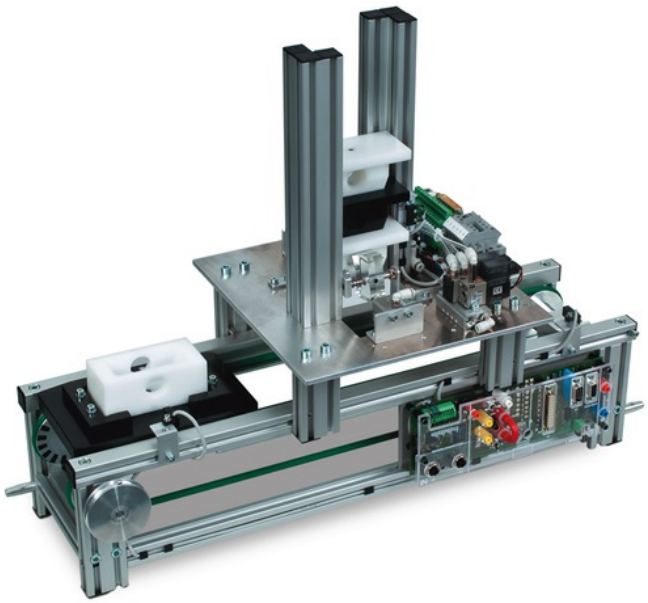


IMS 3 Sorting

A workpiece carrier is located on the conveyor belt. The carrier is positioned under the shaft for the gravity-feed magazine. The sorting station has a magazine that accommodates six bottom pieces. One piece is selected and placed in the carrier. The carrier and its load are then conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
410	**Sorting station**	LM9680	1

IMS 4 Assembly

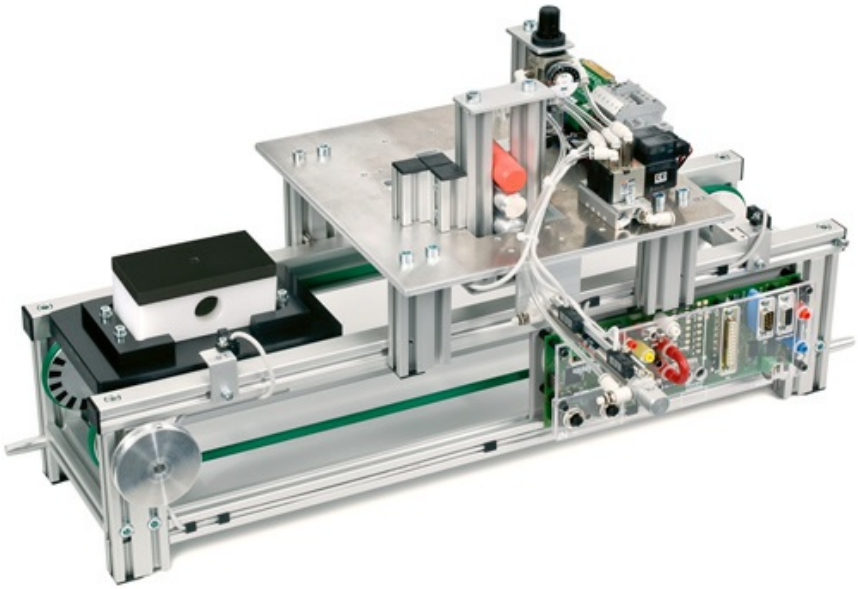


IMS 4 Assembly

A workpiece carrier is located on the conveyor belt. The carrier is positioned under the shaft for the gravity-feed magazine. The sorting station has a magazine that accommodates six top pieces. One piece is selected and placed in the carrier. The carrier and its load are then conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
411	**Assembly station**	LM9681	1

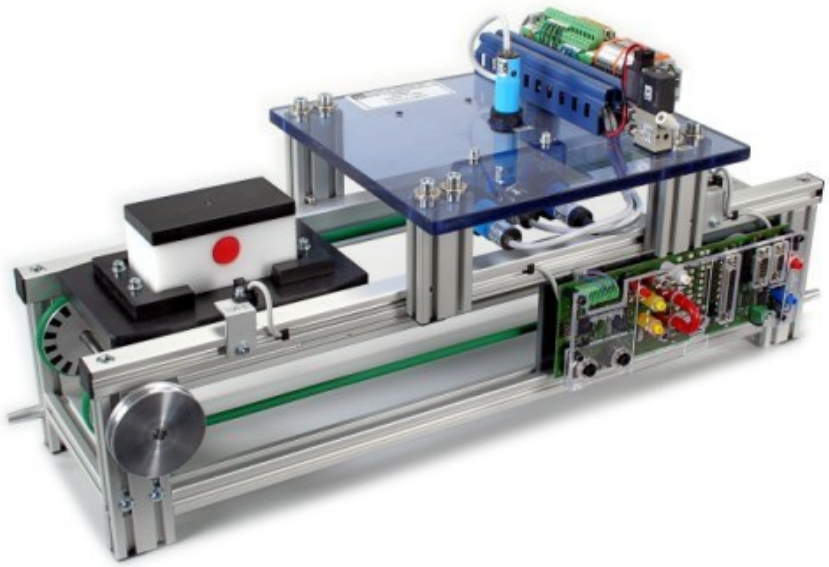
IMS 5 Processing



IMS 5 Processing

A workpiece carrier is located on the conveyor belt. It is loaded with a fully assembled two-component workpiece (top and bottom pieces). The carrier and its load are positioned beneath the process module. The workpiece is clamped for processing. A bolt from the gravity-feed magazine is pressed into the hole in the workpiece. The clamp opens and the carrier and load are conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
412	**Processing station**	LM9682	1



IMS 6 Testing

A carrier with a fully assembled workpiece is located on the conveyor belt. A stopper positions the piece alongside the sensors. The sensors detect the colour of the piece, its material and optionally its height. Test data will be saved for subsequent processes. After each successfully completed test the carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
413	**Testing station**	LM9684	1

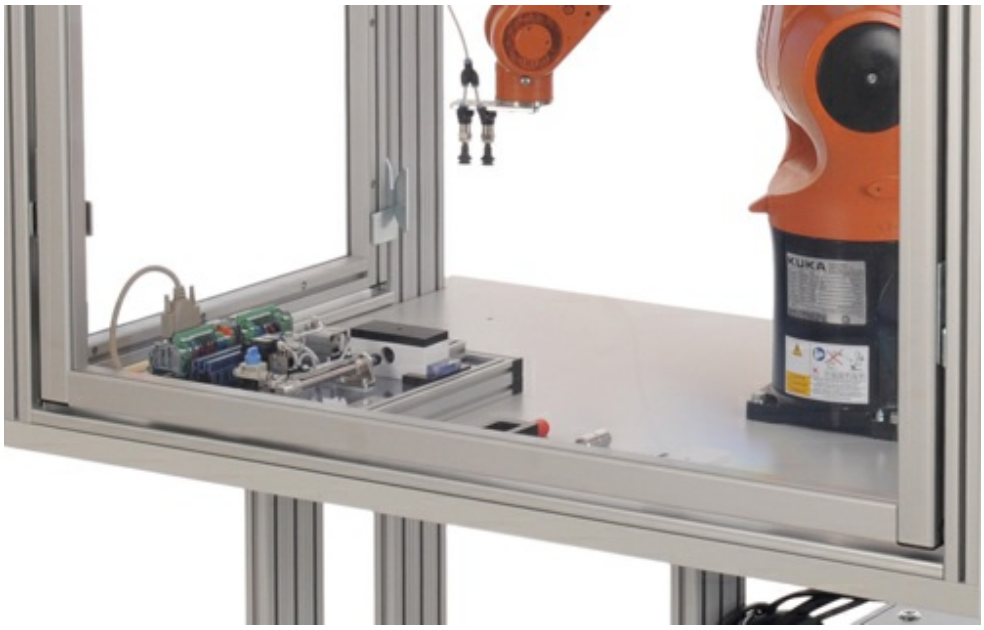
IMS 8 Storage

IMS 8 Storage

A carrier with a fully assembled and tested workpiece is located on the conveyor belt. The carrier is stopped at the removal position. The handling module lifts up the workpiece and transfers it to one of twenty possible storage positions. The storage positions can be chosen according to the production task and test results. The empty carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
414	**High rack storage station with 20 storage cells**	LM9641	1

CRK 12 Kuka Industrial Robot with Project Equipment Set for Disassembly



CRK 12 Kuka Industrial Robot with Project Equipment Set for Disassembly

With the “disassembly“ project equipment set, the assembled workpieces are disassembled with the aid of the industrial robot and individual parts assorted into the storage trays provided for this purpose. For example, the storage trays can be selected and targeted for deposit activation by the PLC and the touchpanel connected to the robot via the Profinet.

Pos.	Product name	Bestell-Nr.	Anz.
415	**Industrie Robot Kuka KR6 R700 sixx, 6 Axis, 6kg**	LM9691	1
416	**Mobile Experiment Trolley with Protective Housing for Robotics, SybaPro, 1200mm**	ST7200-3Q	1
417	**Parallel finger gripper for LM9661/LM9691**	LM9662	1
418	**Disassembly station for robots**	LM9637	1

S7-1500 PLC control system with accessories:

Pos.	Product name	Bestell-Nr.	Anz.
419	**SIMATIC S7-1516-3 PN/DP 32 DE, 32 DA, 8 AE, 4 AA, 24V / 6 A power supply**	CO3713-8R	1
420	**Touch panel TP700 Comfort Trainer Package**	CO3713-4P	1
421	**Safety connecting plug 4mm with tap (2x), red, 1000V/32A CAT II**	SO5126-3U	1
422	**Safety connecting plug 4mm with tap (2x), blue, 1000V/32A CAT II**	SO5126-3V	1
423	**Safety measurement cable (4mm), 100cm/40", blue**	SO5126-9A	1
424	**Safety measurement cable (4mm), 100cm/40", red**	SO5126-8U	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
425	**Double conveyor belt segment, passive**	LM9603	3
426	**180° conveyor belt segment**	LM9611	2
427	**Workpiece transport pallet**	LM9520	5
428	**Workpiece, top section, white**	LM9521	5
429	**Workpiece, top section, black**	LM9522	5
430	**Workpiece, bottom section, white**	LM9524	5
431	**Workpiece, bottom section, black**	LM9525	5

432	**Bolt workpiece, metal**	LM9527	5
433	**Bolt workpiece, plastic, red**	LM9528	5
434	**IMS manual control unit**	LM9638	1
435	**IMS magnetic sensor for conveyor belt, including mounting**	LM9675	1
436	**IMS capacitive sensor for conveyor belt, incl. mounting**	LM9678	1
437	**Compressor, low-noise**	SE2902-9L	1
438	**Tubing and accessory set for mechatronics systems**	LM9670	1
439	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	7
440	**Initial programming and calibration setup of IMS26 before leaving the factory**	LA9526	1
441	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
442	**IMS/IPA test and fault simulator**	CO3713-7V	1
443	**Serial interface cable 9/9 pole**	LM9040	2
444	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2

445	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS furniture

IMS furniture

The IMS furniture system is used together with the Industrial Mechatronics System. The mobile trolleys can be used for individual components or sub-systems. In order to build complex, mechatronics systems, the trolleys can be lined up alongside one another and can be supplemented by frames to accommodate training panels. A power console allows the trolley to be equipped with a wide variety of 3 HU modules. The trolleys can be extended by means of various add-ons attachable to the aluminium rails to make up a multi-function PC experiment trolley.

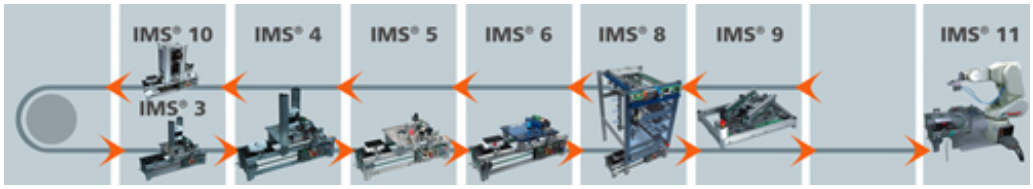
Pos.	Product name	Bestell-Nr.	Anz.
446	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	2
447	**SybaPro mobile IMS experiment trolley, 1200mm**	ST7200-3U	2
448	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
449	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1
450	**Interactive Lab Assistant: IMS 8 Storage station**	SO2800-5H	1
451	**Interactive Lab Assistant: Production line with 5 stations**	SO2800-5R	1
452	**Interactive Lab Assistant: Production line with 6 stations**	SO2800-5S	1

453	**Interactive Lab Assistant: CRK10 Configuration of Kuka robot**	SO2800-4S	1
454	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
455	**QuickChart, IMS 3 Mechatronics Sorting sub-system**	SO6200-1C	1
456	**QuickChart, IMS 4 Mechatronics Assembly sub-system**	SO6200-1D	1
457	**QuickChart, IMS 5 Mechatronics Process sub-system**	SO6200-1E	1
458	**QuickChart, IMS 6 Mechatronics Testing sub-system**	SO6200-1F	1
459	**QuickChart, IMS 8 Mechatronics Storage sub-system**	SO6200-1H	1
460	**QuickChart, IMS 25 Production line with 5 stations**	SO6200-1R	1
461	**QuickChart, IMS 26 Production line with 6 stations**	SO6200-1S	1
462	**QuickChart IMS Manual operating device**	SO6200-1V	1

IMS 28 flexible manufacturing line with 8 stations



IMS 28 flexible manufacturing line with 8 stations

This facility can be used for fully automated manufacture of a 3-part workpiece (up to eight different final products being permissible). IMS 28 comprises stations for sorting, assembly, processing, testing, routing, buffering and dis-assembly. All stations can be used individually or combined as required. Carriers on dual conveyor belts are used to transport workpieces between the individual sub-systems.

Making exclusive use of actuators and sensors found typically in industrial applications, this training facility permits realistic simulations of complex, continuous industrial production processes. The facility is also controlled by PLC systems commonly used in the industry and incorporating a process-field bus as well as decentralized peripherals. Optional extensions comprising modern, industrial communication systems are provided for. Promoting an acquisition of skills as part of teamwork, the system enables students to independently gain a basic understanding of mechatronic systems.

Each sub-system is designed so that the student can acquire the necessary skills and knowledge step-by-step, starting with simple automation operations and sequences, and ending in development of complex automation programs. Standardized interfaces allow a use of various industrial PLC control units or the UniTrain-I system.

- Transport system: Dual conveyor belts with DC drive motors and a variable-speed, three-phase drive motor.
- Identification system: Six workpiece carriers are each furnished with a fixed code. A reading unit is mounted on each station.
- Identification system: An RFID identification system can be installed optionally.
- Supervisory level: Preparation of production orders on the control station PC; process visualization and operational-data acquisition
- Linkage of the process control station via TCP/IP
- IMS 1.2 DC transport system
- IMS 3 sorting station
- IMS 4 assembly station
- IMS 5 processing station
- IMS 6 testing station
- IMS 8 storage station
- IMS 9 routing station
- IMS 10 buffering station
- IMS 11 dis-assembly station

IMS 1.5: Cyber physical transport system

IMS 1.5: Cyber physical transport system

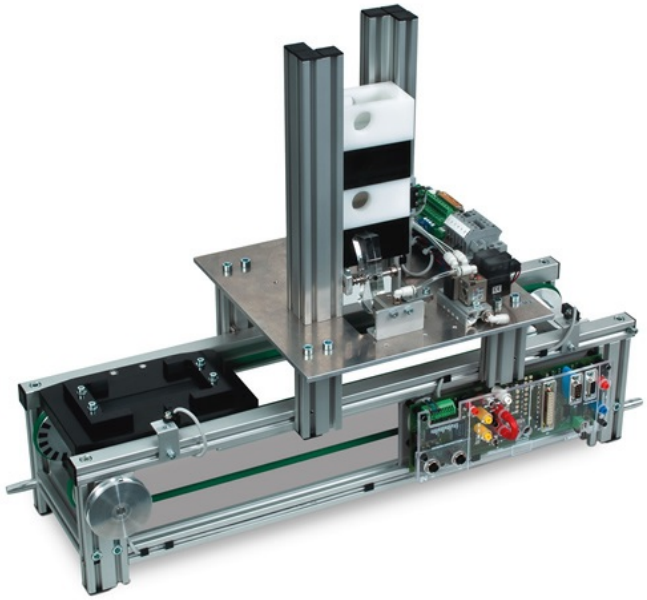
The conveyor belt system is the element that connects all of the subsystems and thus forms the backbone of the entire production line. In the IMS® production line the conveyor belt systems are self-contained modules, which can be integrated with the sub-systems as needed. Basic processes like “positioning” and “speed” can be demonstrated with just this simple system.

Training objectives for DC transport system

- Principle and function of various sensors
- Making controlled movements on a single axis
- Incremental positioning of a workpiece carrier
- Disabling movement forwards or backwards
- Program for monitoring slip and whether a machine is stopped
- Safe handling of various safety circuits and locks.

Pos.	Product name	Bestell-Nr.	Anz.
463	**Cyber-physical Conveyor System**	LM9515	8
464	**DC power supply 24V/5A for IMS conveyor belts**	LM9672	8

IMS 3 Sorting

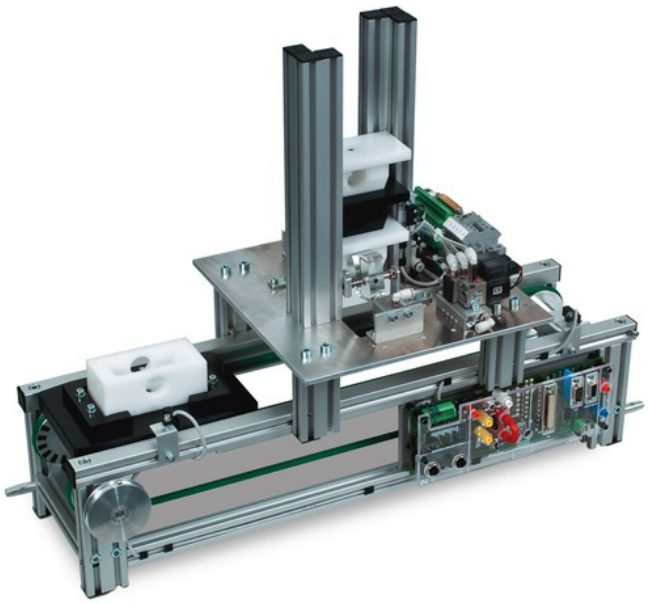


IMS 3 Sorting

A workpiece carrier is located on the conveyor belt. The carrier is positioned under the shaft for the gravity-feed magazine. The sorting station has a magazine that accommodates six bottom pieces. One piece is selected and placed in the carrier. The carrier and its load are then conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
465	**Sorting station**	LM9680	1

IMS 4 Assembly

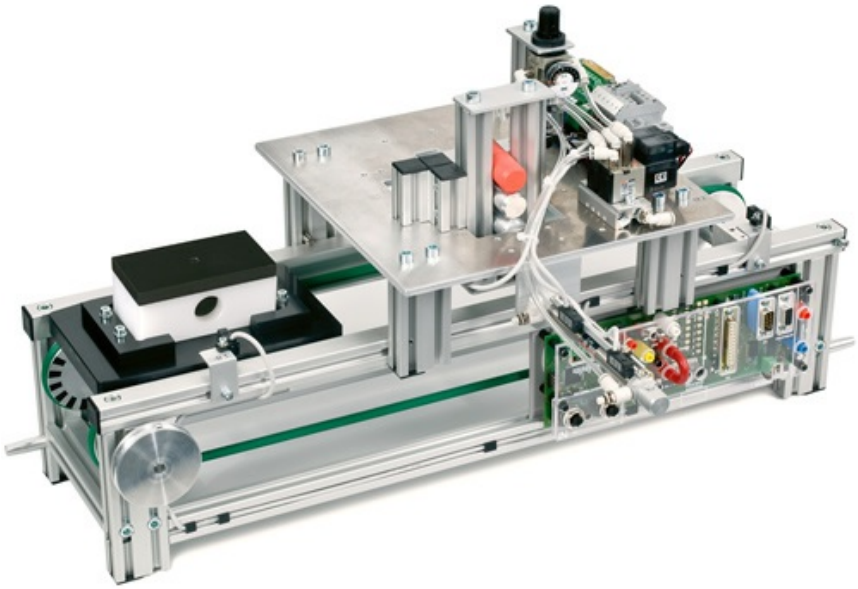


IMS 4 Assembly

A workpiece carrier is located on the conveyor belt. The carrier is positioned under the shaft for the gravity-feed magazine. The sorting station has a magazine that accommodates six top pieces. One piece is selected and placed in the carrier. The carrier and its load are then conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
466	**Assembly station**	LM9681	1

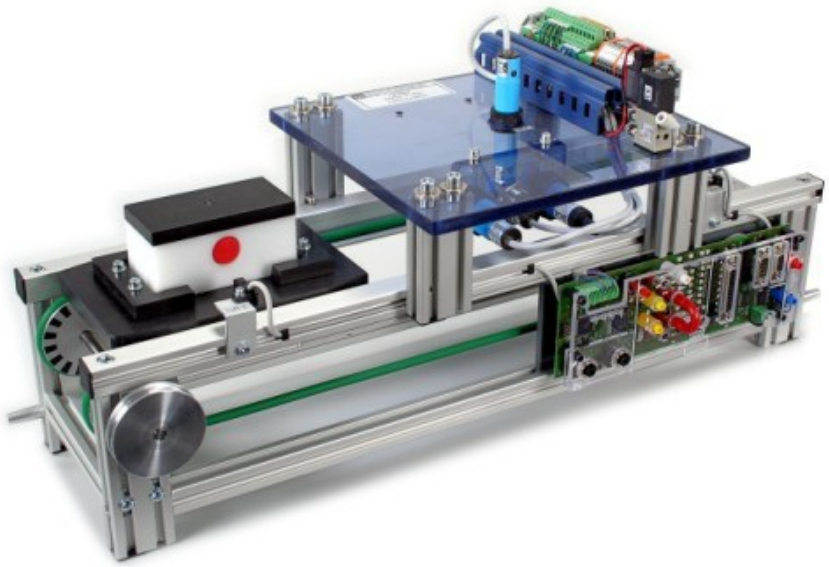
IMS 5 Processing



IMS 5 Processing

A workpiece carrier is located on the conveyor belt. It is loaded with a fully assembled two-component workpiece (top and bottom pieces). The carrier and its load are positioned beneath the process module. The workpiece is clamped for processing. A bolt from the gravity-feed magazine is pressed into the hole in the workpiece. The clamp opens and the carrier and load are conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
467	**Processing station**	LM9682	1



IMS 6 Testing

A carrier with a fully assembled workpiece is located on the conveyor belt. A stopper positions the piece alongside the sensors. The sensors detect the colour of the piece, its material and optionally its height. Test data will be saved for subsequent processes. After each successfully completed test the carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
468	**Testing station**	LM9684	1

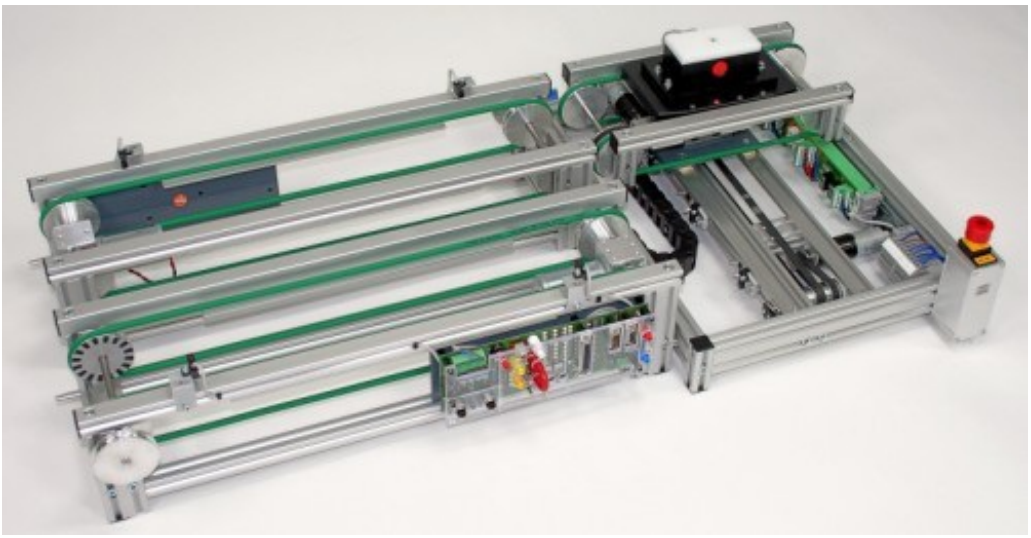
IMS 8 Storage

IMS 8 Storage

A carrier with a fully assembled and tested workpiece is located on the conveyor belt. The carrier is stopped at the removal position. The handling module lifts up the workpiece and transfers it to one of twenty possible storage positions. The storage positions can be chosen according to the production task and test results. The empty carrier is conveyed to the end of the belt to be passed on to the next sub-system.

Pos.	Product name	Bestell-Nr.	Anz.
469	**High rack storage station with 20 storage cells**	LM9641	1

IMS 9 Routing

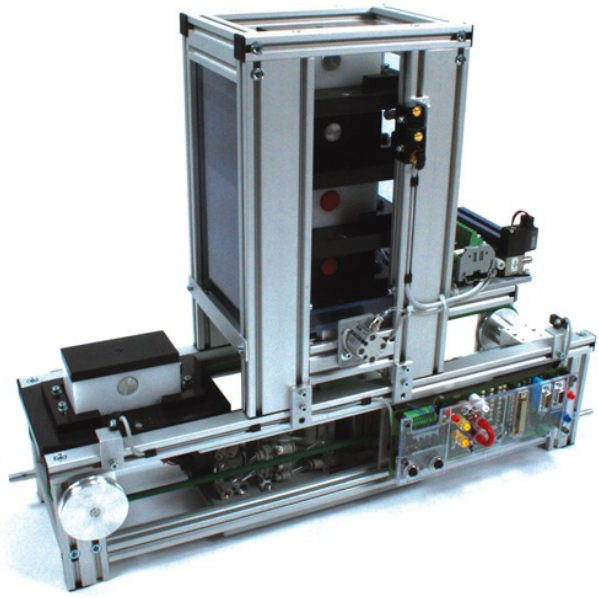


IMS 9 Routing

A workpiece carrier is located on the conveyor belt. The routing unit receives the carrier and transfers it to a revolving transport unit. The revolving unit can determine the further routing of the carrier. The carrier can be picked up and passed on in any one of three positions.

Pos.	Product name	Bestell-Nr.	Anz.
470	**Routing station**	LM9614	1

IMS 10 Buffering

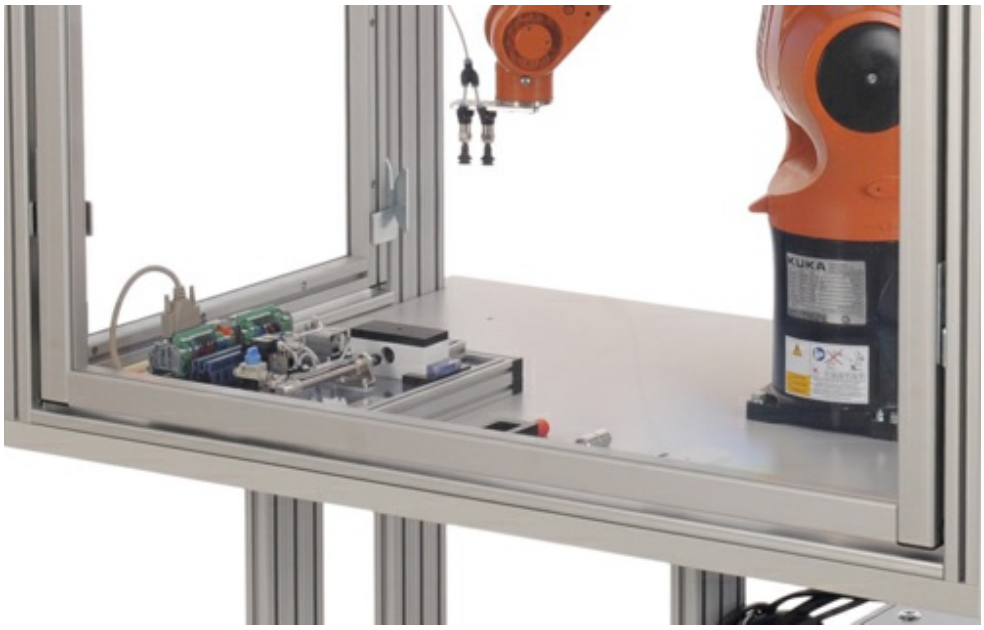


IMS 10 Buffering

The conveyor belt is equipped with two lifting units for buffering or queuing workpieces in complex mechatronics systems. The buffer controls the flow of materials. The carrier is lifted from the conveyor belt by a lifting unit and deposited in a magazine, while the belt continues moving with other pieces. Up to four laden or 10 unladen workpiece carriers can be held in store. The lifting unit can set the workpiece back onto the conveyor when necessary.

Pos.	Product name	Bestell-Nr.	Anz.
471	**Material buffering station**	LM9687	1

IMS 11 Disassembly by robot



IMS 11 Disassembly by robot

A carrier with a fully assembled and tested workpiece is located on the conveyor belt. The carrier is stopped at the removal position. The robot lifts up the workpiece and transfers it to the dismantling station. The workpiece is clamped in place. The individual pieces of the workpiece are taken apart. The robot sorts the individual components into pre-defined storage places.

Pos.	Product name	Bestell-Nr.	Anz.
472	**Disassembly station for robots**	LM9637	1
473	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
474	**Industrie Robot Kuka KR6 R700 sixx, 6 Axis, 6kg**	LM9691	1
475	**Pneumatic gripper for LM9661/LM9691**	LM9663	1
476	**Mobile Experiment Trolley with Protective Housing for Robotics, SybaPro, 1200mm**	ST7200-3Q	1
477	**Interactive Lab Assistant: CRK10 Configuration of Kuka robot**	SO2800-4S	1

478	**QuickChart CRK 10 Kuka Robot**	SO6200-2M	1

S7-1500 PLC control system with accessories:

Pos.	Product name	Bestell-Nr.	Anz.
479	**SIMATIC S7-1516-3 PN/DP 32 DE, 32 DA, 8 AE, 4 AA, 24V / 6 A power supply**	CO3713-8R	1
480	**Touch panel TP700 Comfort Trainer Package**	CO3713-4P	1
481	**Safety connecting plug 4mm with tap (2x), red, 1000V/32A CAT II**	SO5126-3U	1
482	**Safety connecting plug 4mm with tap (2x), blue, 1000V/32A CAT II**	SO5126-3V	1
483	**Safety measurement cable (4mm), 100cm/40", blue**	SO5126-9A	1
484	**Safety measurement cable (4mm), 100cm/40", red**	SO5126-8U	1

Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
485	**Double conveyor belt segment, passive**	LM9603	3
486	**180° conveyor belt segment**	LM9611	1
487	**Workpiece transport pallet**	LM9520	6
488	**Workpiece, top section, white**	LM9521	5
489	**Workpiece, top section, black**	LM9522	5

490	**Workpiece, bottom section, white**	LM9524	5
491	**Workpiece, bottom section, black**	LM9525	5
492	**Bolt workpiece, metal**	LM9527	5
493	**Bolt workpiece, plastic, red**	LM9528	5
494	**ID scanning unit, 4bit**	LM9635	2
495	**IMS manual control unit**	LM9638	1
496	**IMS capacitive sensor for conveyor belt, incl. mounting**	LM9678	1
497	**IMS magnetic sensor for conveyor belt, including mounting**	LM9675	1
498	**Compressor, low-noise**	SE2902-9L	1
499	**Tubing and accessory set for mechatronics systems**	LM9670	1
500	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	10
501	**Initial programming and calibration setup of IMS 28 before leaving the factory**	LA9528	1
502	**IDG3 membrane dryer with rapid coupling and filter AF20 with water trap**	LM9671	1

IMS/IPA Tester and Fault Simulator

Pos.	Product name	Bestell-Nr.	Anz.
503	**IMS/IPA test and fault simulator**	CO3713-7V	1
504	**25-pin serial interface cable, Sub-D plug/socket**	LM9061	2
505	**QuickChart IMS test and fault simulator**	SO6200-1Z	1

IMS furniture

IMS furniture

The IMS furniture system is used together with the Industrial Mechatronics System. The mobile trolleys can be used for individual components or sub-systems. In order to build complex, mechatronics systems, the trolleys can be lined up alongside one another and can be supplemented by frames to accommodate training panels. A power console allows the trolley to be equipped with a wide variety of 3 HU modules. The trolleys can be extended by means of various add-ons attachable to the aluminium rails to make up a multi-function PC experiment trolley.

Pos.	Product name	Bestell-Nr.	Anz.
506	**SybaPro mobile IMS experiment trolley with experiment frame, 1200mm, 2 levels**	ST7200-3T	2
507	**SybaPro mobile IMS experiment trolley, 1200mm**	ST7200-3U	3
508	**Monitor holder for flat screen monitor of weight up to 10kg, DIN A4, VESA 75/100**	ST8010-4K	1

Media:

Pos.	Product name	Bestell-Nr.	Anz.
509	**Interactive Lab Assistant: IMS 1.5 Conveyor Belt with PLC and Processing Stations**	SO2805-5N	1

510	**Interactive Lab Assistant: IMS 8 Storage station**	SO2800-5H	1
511	**Interactive Lab Assistant: IMS 9 Routing station**	SO2800-5J	1
512	**Interactive Lab Assistant: IMS 10 Buffering station**	SO2800-5K	1
513	**Interactive Lab Assistant: Production line with 5 stations**	SO2800-5R	1
514	**Interactive Lab Assistant: Production line with 6 stations**	SO2800-5S	1
515	**Interactive Lab Assistant: Production line with 8 stations**	SO2800-5T	1
516	**Interactive Lab Assistant: CRK10 Configuration of Kuka robot**	SO2800-4S	1
517	**QuickChart IMS 1.5 Cyber-physical conveyor belt system**	SO6200-2P	1
518	**QuickChart, IMS 3 Mechatronics Sorting sub-system**	SO6200-1C	1
519	**QuickChart, IMS 4 Mechatronics Assembly sub-system**	SO6200-1D	1
520	**QuickChart, IMS 5 Mechatronics Process sub-system**	SO6200-1E	1
521	**QuickChart, IMS 6 Mechatronics Testing sub-system**	SO6200-1F	1
522	**QuickChart, IMS 8 Mechatronics Storage sub-system**	SO6200-1H	1
523	**QuickChart, IMS 9 Mechatronics Routing sub-system**	SO6200-1J	1
524	**QuickChart, IMS 10 Mechatronics Buffering sub-system**	SO6200-1K	1
525	**QuickChart, IMS 11 Mechatronics Disassembly sub-system**	SO6200-1N	1

526	**QuickChart, IMS 25 Production line with 5 stations**	SO6200-1R	1
527	**QuickChart, IMS 26 Production line with 6 stations**	SO6200-1S	1
528	**QuickChart, IMS 28 Production line with 8 stations**	SO6200-1T	1
529	**QuickChart IMS Manual operating device**	SO6200-1V	1