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Building management systems

Training systems / trainers for electrical wiring/building management systems:

- Protective circuitry, protective measures, building mains feed, lighting and intercom systems
- Industrial wiring, intercoms, alarm systems, hazard alarms and access control
- KNX/EIB, LON
- Project work, technical practice, assembly practice systems, planning software

InsTrain wiring installation training system



InsTrain wiring installation training system

The InsTrain Multimedia Installation Lab is a computer-based training and experiment system designed for training and further education in installing electrical wiring. InsTrain has been developed jointly by the **InsTrain Group**, which includes the following members:

- Lucas-Nülle
- Bfe Oldenburg
- Hager-Tehalit
- Dehn&Söhne
- Gossen-Metrawatt
- Busch-Jaeger
- WAGO
- Rutenbeck
- Data Design System

The InsTrain wiring installation training system is a unique, comprehensive experiment hardware system with an interface and multimedia training programs. It is conceived in such a way so as to integrate cognitive and hands-on training into an overall concept linking together theory and practice and thus allowing specific targeting of handling skills. A host of multimedia courses, starting from the basics and extending up to advanced topics, is available for schools, vocational colleges and training of engineers.

Multimedia-based, animated training units lead through the theory and provide instructions for conducting experiments. This allows trainees to work unsupervised, although the system also allows teachers and training staff the freedom to intervene at any juncture according to the needs of students.

The system's multimedia learning environment and the large proportion of independent learning ensure high levels of motivation in students and maximise their degree of success in learning the material to guarantee that topics are learned effectively and efficiently. Access to the multimedia courses along with the control of virtual instruments and fault simulation is provided by LabSoft, the system's open experimentation platform. The courses convey the theoretical background and allow for experiments to be performed using the appropriate hardware for the course. The hardware includes an intelligent interface with a USB port, which provides the capacity to make high-quality measurements when used in conjunction with the system's integrated virtual instruments. In addition, the progress of students can be checked by having them identify a variety of simulated faults or by means of knowledge tests. All results can be documented electronically.

With the aid of the integrated fault simulation capability, students can be given various exercises in which they can use typical measuring equipment to trace faults and document their results. The interactive training and experiment software can be used by students to test their knowledge and it also provides feedback regarding the results of experiments. All experiments can be undertaken with the fault simulation switched on or off. By combining the various simulated faults, a large number of exercises can be devised.

LabSoft INSTRAIN courses

The InsTrain system has numerous wiring installation training systems available for the various aspects of electrical wiring, each in a package including a multimedia course. All the training programs run in a special course browser (LabSoft) providing control, management and display of the training program itself, plus a set of virtual instruments. InsTrain courses train practical skills by teaching the theoretical background and then guide students through multiple measurements to be carried out on the installed system. Thus, the measurement interface is integrated with the training program. With the help of virtual instruments as well as using commercial measuring equipment, the installation can be analysed and the results of measurements stored directly in the training program.

Hardware:

- Wiring installation training system with pre-configured modules and installations for carrying out measurements as specified in the course or for any other experiments
- Measuring points easily accessible via 4 mm safety sockets
- Systematic fault-finding, ability to activate simulated faults via relay and USB interface (password-protected)
- Common circuitry providing high degree of relevance to practice

Software:

- Interactive, HTML-based multimedia courses for teaching theoretical knowledge and practical skills
- Theory, experiment instructions, experiment results, fault finding, self-testing questions and sample solutions
- Animations, graphics and pictures explaining theory and experiments
- All courses can be edited with the aid of an HTML editor
- LabSoft browser with menu bar, navigation and display windows for display and execution of all InsTrain courses
- Virtual instruments (VIs) for real-time measurements or generating output signals
- Navigation to anywhere within a course or between different courses
- User-specific documentation, evaluation and storage of experiment results
- Management of courses, users and user groups
- Option to integrate planning software, course editors etc. into menu
- Option to include and display courses of your own design

EGT 3 Communication and networks



EGT 3 Communication and networks

The wiring installation training module on networks is a multimedia training project covering the following topics:

- Application-neutral communications cabling in conformance with EN 50173-4
- Cabling in conformance with EN 50173-4
- Infrastructure for disseminating data using Home Office
- Sub-distribution from electricity meter panel for multimedia applications
- Connectors/cabling (to install yourself), difference between optical fibres, polymer optical fibres and cables
- LAN/WLAN applications
- Expansions to system (radio, co-ax etc.)
- Calculation and installation of aerial/cabling systems
- Lightning and excess voltage protection
- Handover report for installation
- Fault simulation

Different software packages are used to work through the various training stages in a training system that very closely follows actual practice. The training software is specially designed for educational use and provides hierarchical, structured guidance to the student. This provides a considerable boost to the self-learning aspect of the system.

Equipment set comprising the following:

Pos.	Product name	Bestell-Nr.	Anz.
	Lucas Nülle GmbH		

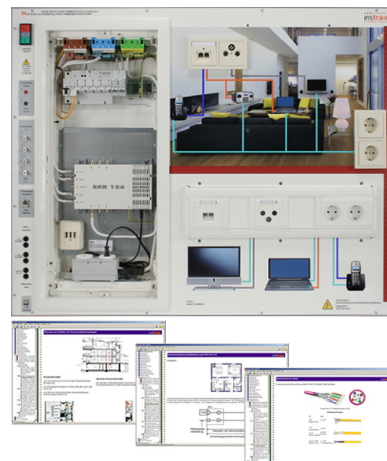
1 Building management training kit: interface, networks, fault sim.

SE2671-1E

1

The training objectives are organised as follows:

- Training projects, overview
- Connection of two PCs using a cross-over cable
- Making and testing a cross-over cable
- Installation, wiring and testing of two RJ45 sockets in a channel segment
- Networking PCs via RJ 45 sockets (no soldering, screwing or stripping)
- Equipping a distributor with NTBA, W-LAN router, etc.
- Installation of a patch panel in a multimedia distributor
- Making a patch cable
- Networking PCs via network switches and patch panels
- Networking two PCs via polymer optical fibre (POF)
- Configuring a DSL connection
- Setting up a W-LAN connection
- Inputting a signal via a DVB-T receiver
- Installation of lead-through and terminal sockets in a channel segment (co-ax)
- Documentation, handover and test report



All experiments can be undertaken with fault simulation switched on or off. By combining the various simulated faults, a large number of exercises can be devised.

Technical data

- Operating voltage: 230/400V/50Hz
- Connector: 16A earthed plug
- PC connection: USB
- Functional elements:
 - Multimedia distribution cabinet
 - 4-way switch
 - 4-port hub
 - 2 plug sockets for appliances with protection class II
 - DSL W-LAN router
 - 2 earthed plug sockets 230V
 - Splitter
 - 2 channel segments
 - Assembly equipment for RJ 45 sockets, Cat 6a
 - 2 RJ45/fibre-optic converters
 - Assembly equipment for antenna sockets
 - Assembly equipment for fibre optic/POF
- Integrated measuring instruments:
 - 2 voltmeters, max. 600V
 - 1 ammeter, max. 10A
 - 1 three-channel oscilloscope, max. 600V

- Dimensions: 1000 x 800 x 220mm
- Weight: 45kg

Apart from the educational training software, the topic can be supplemented by planning software for an entire building installation. This software encompasses the areas of electricity, bathroom installation, heating, air conditioning and ventilation. Integrated product databases for various manufacturers allow for the following functions to be implemented:

- Generation of 2D or 3D floor plans
- Generation of wiring plans for differing installations
- Generation of plans for TV facilities, networks, telephone networks
- Generation of tendering documents
- Generation of equipment lists
- Generation of distribution plans
- Accommodation for installation guidelines
- Generation of test documents

Additionally recommended

Pos.	Product name	Bestell-Nr.	Anz.
2	Wireless LAN USB device server	LM9080	1

USB device server for connecting USB equipment to a network via a WLAN or LAN link. Instead of connecting directly via a local USB port, communication between the computer and the training system is handled by the USB device server via WLAN or LAN connection.



Technical data:

- Device Interfaces: 2 x USB 2.0 Hi-Speed Port (using an optional USB hub, a max. of 15 USB connections are possible)
- Network Interfaces: LAN / WLAN: 10, 100, 1000 Mbps (auto-detect) / IEEE 802.11a/b/g/n, up to 300 Mbit
- Built-in antenna (2T2R) for WLAN
- WLAN: Ad-hoc- or infrastructure mode
- Supported wireless security: WEP(64/128), WPA-PSK(TKIP/AES), WPA2-PSK(AES)
- Configuration via setup program or web-interface
- Supported Operating Systems: Windows 8/7/Vista/XP, Server 2008/2003
- Dimensions main unit: B: 126,4 mm × D: 71,5 mm × H: 24,2 mm (±2 mm)
- Weight: 105 g

Includes:

- Main unit
- Wide-range power supply, 100-240V, 50/60Hz
- Patch lead for configuration
- CD-ROM with configuration and operating software, instruction manual
- Expanded instruction manual with configuration examples

3 Multi13S digital multimeter

LM2330

1

Universal precision lab multimeter and temperature meter with IR interface for high-quality, universal measurement and testing in educational settings, power plants, process control installations etc.

- 3¾-digit multimeter; resolution: $\pm 3,100$ digits
- Measurement classification CATII-1000V
- Can be connected to UniTrain system via IR interface
- Voltage and current measuring ranges: 30mV-1000V DC, 3V-1000V AC; 3mA-16A DC; 30mA-10A AC
- Resistance ranges: 30ohm-30Mohm
- Special functions: for temperature measurements using PT100/1000 thermocouple (optional accessory)
- Continuity and diode testing
- Automatic range selection and battery shut-off, min./max. and data hold function
- Safety fuse for current measurement range up to 300mA
- Protection against high currents in the mA range for nominal voltage of 1000V
- Display with bar chart and backlighting
- Includes protective sleeve, measuring leads, 1 x spare fuse, 9V battery, calibration certificate

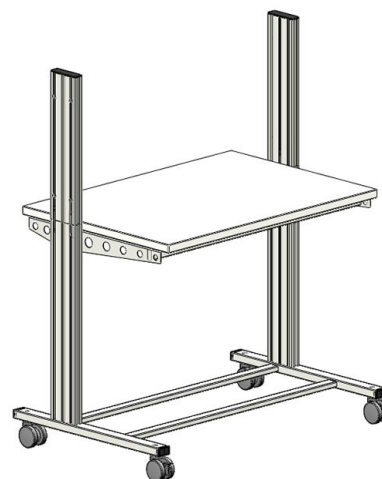


Accessories:

Pos.	Product name	Bestell-Nr.	Anz.
4	SybaPro mobile InsTrain/CarTrain experiment trolley, 1010x1350x700mm	ST7200-3K	1

The mobile aluminium-profile experiment trolley is specially designed to accommodate components of the InsTrain and CarTrain system. All the Ins-Train and CarTrain system components can be safely mounted in structured fashion for lessons from the front of a class or for students' own practicals. For students, this provides a modern, educationally designed workplace with a worktop and connections for multimedia.

- The mobile experiment stand is delivered in kit form and needs to be assembled by the customer
- Aluminium profile with integrated grooves for attaching a wide variety of components (e.g. PC and monitor-holders)
- 4 steerable double casters, 2 with brakes
- Worktop 1005 x 30 x 700mm (WxHxD)
- Table top made of highly compressed multilayered chipboard conforming to DIN EN 438-1, light grey, with double-sided 0.8 mm slightly textured laminate coating (Resopal) in compliance with DIN 16926
- Table top bordered with solid, impact-resistant edging made of 3-mm thick plastic, colour RAL 7047
- Coating and adhesives must be PVC-free
- Power strip with 5-outlet sockets and power switch, lead and earthed plug
- Height of table top 830 mm
- Dimensions: 1010 x 1350 x 700 (WxHxD)



5 **Under-table cabinet, suspended, 3 drawers, utensil drawer, central locking**

ST8007-1A

1

- 1 Utensil drawer
- 1 Drawer, 2 HU
- 2 Drawers, 4 HU
- Usable width: 330mm, usable depth: 480mm
- Central locking
- Metal drawers with surrounding row of slots
- Body made of 19mm-thick, highly-compressed, multi-layered fine chipboard with grade E1 plastic coating on both sides
- Dimensions: 430 x 580 x 590mm (WxDxH)



6 **PC holder for SybaPro experiment trolleys, height/width adjustable**

ST7200-5A

1

Shelf for desktop PC made of 1.5mm sheet steel punched with holes, suitable for all furniture in the SybaPro aluminium profile range

- Adjustable assembly height
- Adjustable width (160 - 255mm)
- Can be mounted to left or right
- Includes all equipment necessary for assembly (4 bolts and 4 tenon blocks)
- Acid-resistant epoxy-resin powder coating, 80µm thick approx., colour RAL7047



7 Monitor holder for flat screen monitor of weight up to 10kg/22lb, VESA 75/100

ST8010-4L

1

Pivoting monitor holder for attachment to aluminium profiles of furniture in the SybaPro range. Allows a monitor to be placed in the optimum position so that work and experiments are less tiring.



- Pivoting arm with two-part joint
- Quick-lock for adjustment to any height on extruded aluminium profile
- VESA fastening 7.5 x 7.5cm
- Includes VESA 75 (7.5x7.5) - VESA 100 (10x10) adapter
- 2 Cable clips
- Adequate carrying capacity 10kg/22lb
- TFT monitor can be turned parallel to the table edge
- Separation can be adjusted to anywhere between 105 and 480mm
- Additionally included:

Cable management set for installing cables along the profiles of the aluminium lab system furniture in the SybaPro range

The set consists of the following:

- 3 Cross cable binders for front and rear grooves of aluminium profile
- 3 Cross cable binders for side grooves of aluminium profile
- 12 Cable binders
- 4 Aluminium cover profiles for covering and enabling wires to be run along the grooves of an aluminium profile
- Includes assembly instructions

8 Wall or aluminium-profile mounting cable storage for 48 cables

ST8003-8E

1

Accommodates about 48 safety measuring leads (4mm), suitable for mounting on walls or aluminium profiles



- Width 200 mm, 12 guide grooves for leads
- Adjustable height for mounting on aluminium profiles
- Can be mounted on the left or right
- Can be mounted on walls
- Includes 2 screws and tenon blocks
- Acid-resistant epoxy-resin powder coating, thickness 80 µm approx., colour RAL 7047

9 Protection cover for CarTrain/InsTrain experiment trolleys

ST8010-9X

1

Dust cover for CarTrain/InsTrain experiment trolleys

- For protecting equipment from dust and damp
- For keeping equipment out of sight
- Colour: matt dark grey with printed LN logo in orange)
- Material: nylon fabric with polyurethane coating
- High resistant to tearing, impregnated to be washable and waterproof



10 **Set of tools "Electric "**

SE2670-4B

1

Leather case with document pocket and shoulder strap, including tools specifically chosen for the needs of trainees. Edges are reinforced with aluminium corner pieces and the base contains a robust galvanised metal tray. The front and rear of the case can be opened separately and can be locked. The case contains the following tools:



- 1 Telephone crimp tool, straight
 - 1 Combined pliers
 - 1 Angled cutters
 - 1 Wire stripper
 - 2 Workshop screwdrivers
 - 2 Cross-head screwdrivers
 - 4 Electricians' screwdrivers
 - 1 VDE voltage tester
 - 1 Cable knife
 - 1 Jokari cable knife
 - 1 PUK hack saw
 - 1 Electricians' chisel
 - 1 Stone chisel
 - 1 Carpenters' hammer
 - 1 Lump hammer
 - 1 Trowel
 - 1 Plaster tray
 - 1 Paint brush
- Dimensions: 440 x 240 x 340 mm (LxWxH)
- Weight: 5.0 kg