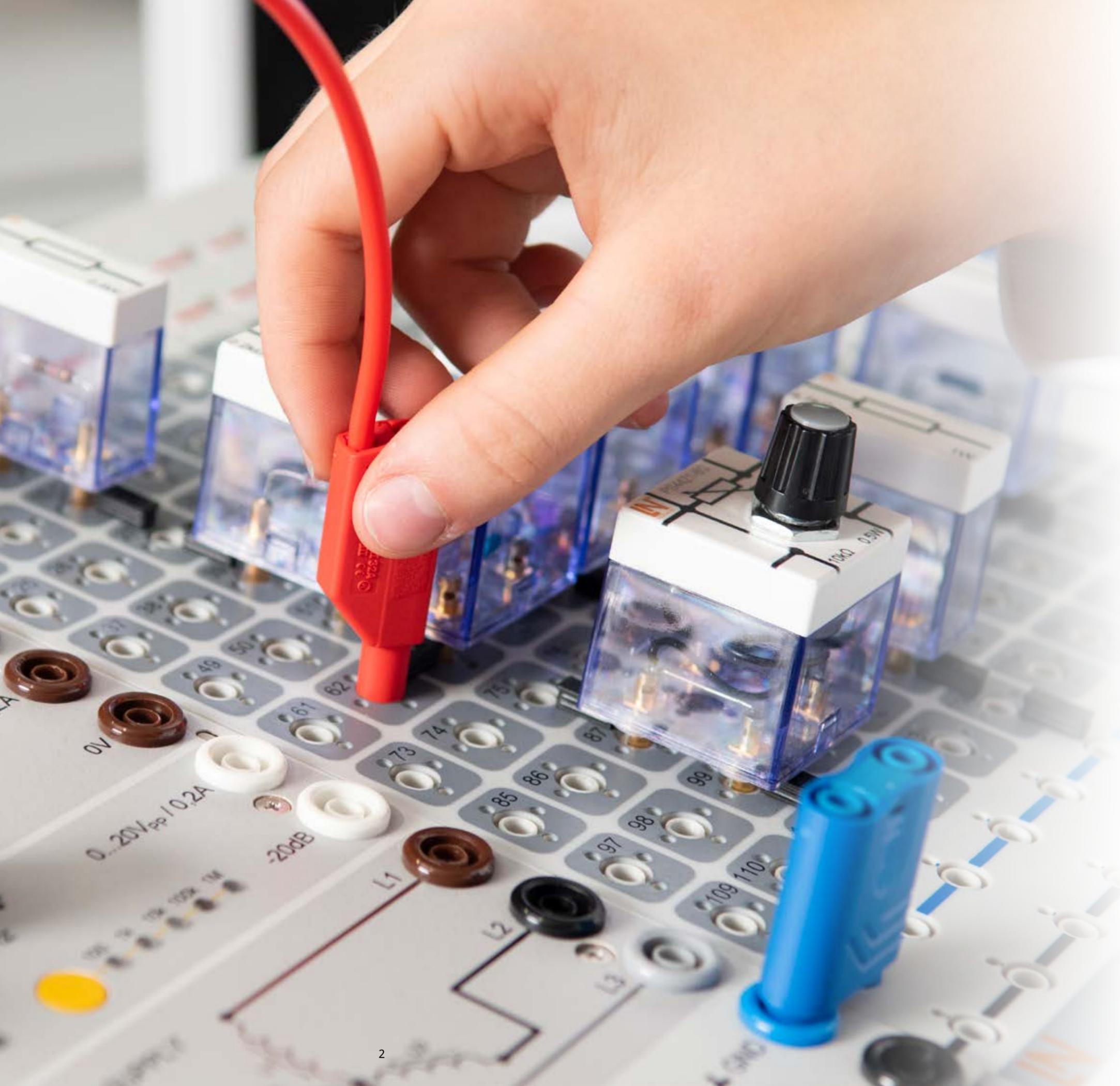


ELOTRAIN

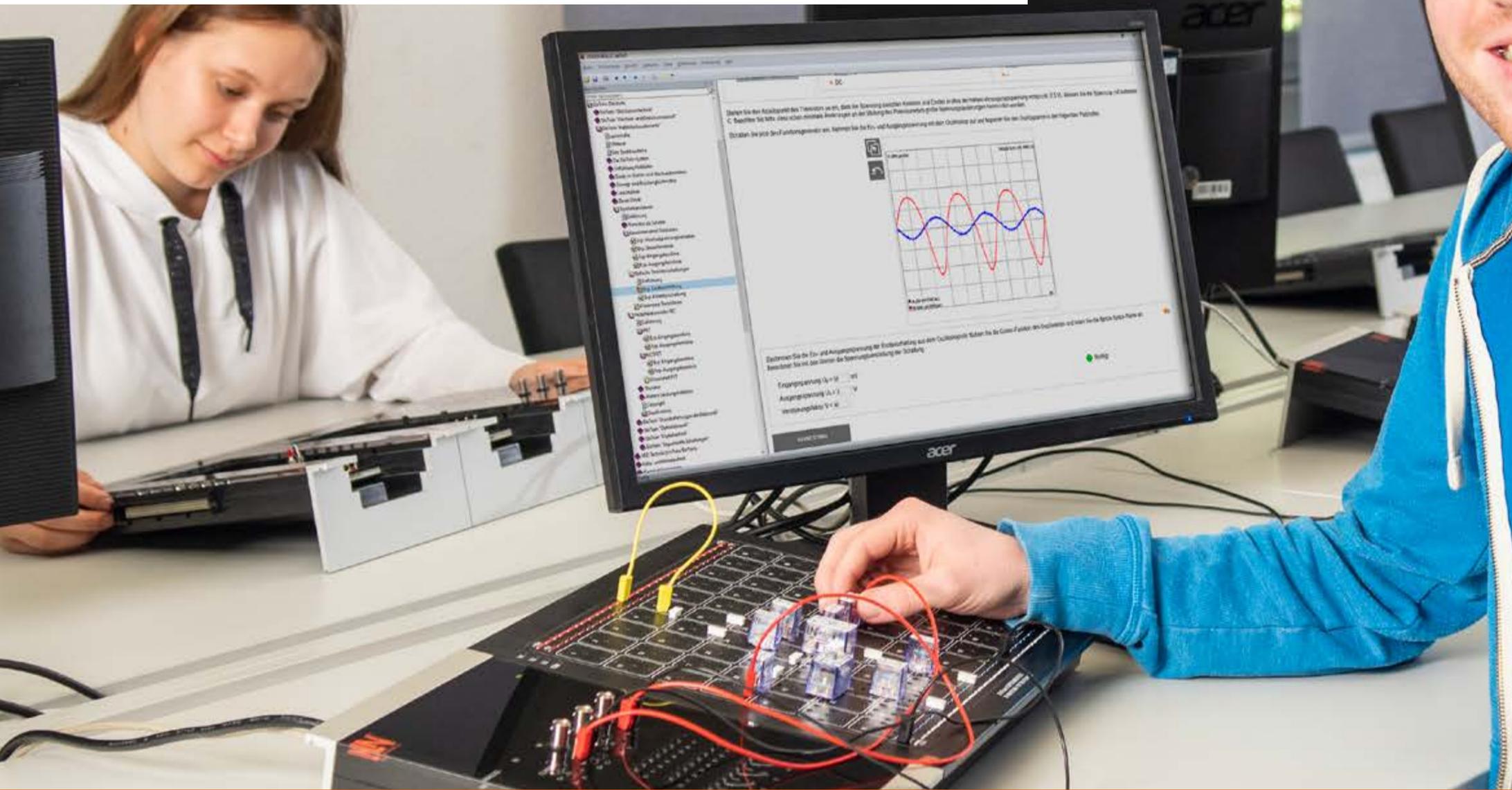
The Multimedia Plug-in Module System



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TRAINING THE BASICS WITH THE ELOTRAIN PLUG-IN SYSTEM



Experiment set-ups that are identical to the circuit diagram

A well-grounded training in the basics of electrical engineering is the prerequisite for understanding complex relationships between electrical and electronic systems. Solid fundamentals help in analyzing and troubleshooting circuitry and guarantee a successful start to professional life.

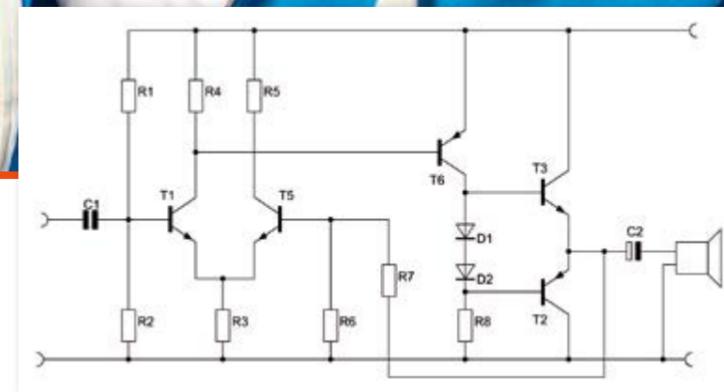
The EloTrain plug-in system is a comprehensive modular component system for performing experiments with electronic circuits. The plug-in modules are used to assemble electronic circuits of varying complexity on the EloTrain experimenters and then put them into operation and record measurements. That is how the circuit diagrams are translated 1 to 1 into experiments while at the same time reducing their level of abstraction.

Experimenting is totally safe even for laypersons thanks to the extra-low voltage. Depending on the platform and requirements, a 2-mm or 4-mm system is available.

The EloTrain plug-in system - the modular component system for authentic, hands-on training and education.

Benefits

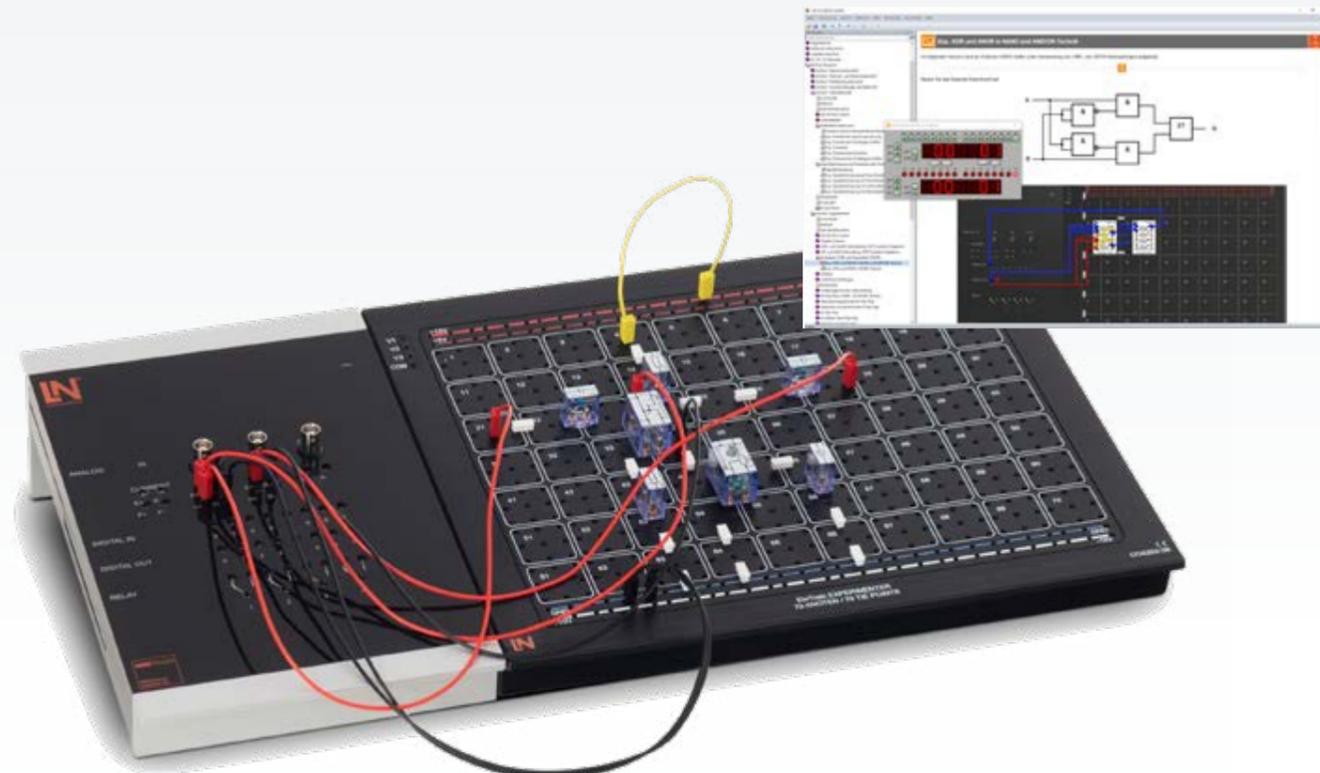
- Experiment set-up and assembly that mirrors the circuit diagram facilitates understanding
- Experiment-based learning to understand complex relationships
- Numerous guided experiments on tried and true circuits
- Maximum flexibility afforded by circuits assembled by the students themselves.
- Totally safe experimenting thanks to the extra-low voltage being applied
- Extra-safe components in transparent housings
- Integrated fault-tolerance thanks to short-circuit proof power supplies



ELOTRAIN PLUG-IN SYSTEM - FEATURING DIFFERENT SYSTEMS

2-mm plug-in system

Multimedia system for UniTrain with learning software



The 2-mm system works in conjunction with the UniTrain-Interface, PC-based measuring instruments and power sources. The tried and true Labsoft learning software guides the student through the experiments deepening an understanding of the underlying theory thanks to numerous animations, graphics and quizzes. It is clearly structured and permits rapid learning progress and also promotes professional skills and media expertise. In combination with UniTrain, the measurement results compiled in the experiments are transferred directly into the LabSoft course and saved for each user specifically.



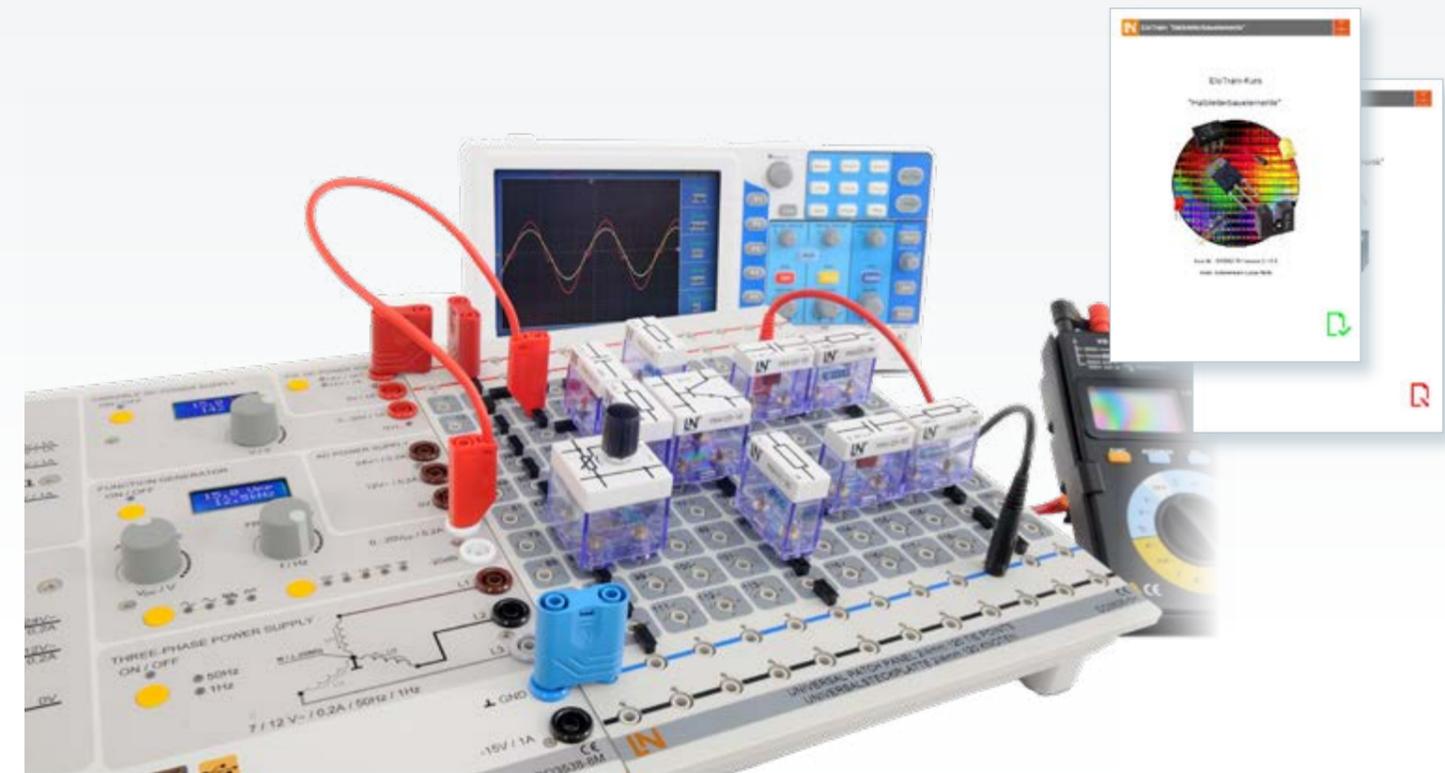
Benefits

- Interface with virtual instruments
- All measurement equipment and power sources needed in a single device
- Experimenter with 70 nodes provides plenty of space for complex circuitry
- Compact plug-in modules for the clearly arranged set-up of larger circuits
- Plug-in modules with gold-plated 2-mm contact plugs
- Active and passive components for a variety of electronic circuits
- Interactive learning software with integrated measurements boosts student motivation
- All course work entries are saved in specific user accounts
- Fast comprehension thanks to animated theoretical material
- Practical skill and expertise gained through autonomous experimenting
- Quizzes and queries to check learning progress provide direct feedback
- 7 courses from the areas of electrical engineering, electronics and digital technology

... FOR DIFFERENT NEEDS

4-mm plug-in system

Tried and tested system including manuals for training the basics



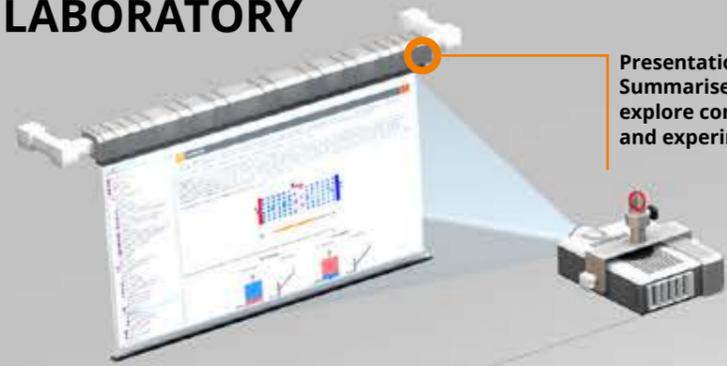
The 4-mm system uses conventional measuring instruments and power sources. The same training contents are taught with the aid of manuals. That way learning can be done by working through the experiments without a PC. Here too by alternating between theory and practice the motivation of the student is boosted and rapid learning success and skills are obtained.



Benefits

- No PC required
- Safe experimenting thanks to clearly structured experiment instructions
- Job skills acquired through individual experimentation
- Teacher version with sample solutions
- 7 manuals covering the areas of electrical engineering, electronics and digital technology
- Flexible power supply: Multi-power supply as a tabletop device or as a power supply unit to insert the power console duct
- Measurement with conventional measuring devices: existing equipment can be used
- Experiment instructions in print format: no PC required
- Cascadable experimenter with power supply bus lines
- Plug-in components with gold-plated and shock-hazard protected plug-in contacts
- Active and passive components for a variety of electronic circuits

MORE THAN A LABORATORY



Presentation tools
Summarise what has been learned and explore complex topics and experiments

Sideboards and cabinets for neat storage of the courses and experiment systems

Everything at your command using the LabSoft Classroom Manager to administer users, groups and courses, monitor learning progress, edit existing courses or create your own.



Standing mobile workstations are ideal for customized configuration of individual learning stations or for group learning



4-mm plug-in system with the EloTrain multi-power supply as a tabletop device or an insert into the multifunction table's power supply console that can be raised or lowered (hidden)

2-mm plug-in system with UniTrain, PC and LabSoft learning programs. Connection terminals and power supplies for the equipment are located in the console under the moveable tabletops of the multimedia desks

2-MM PLUG-IN SYSTEM WITH UNITRAIN

Blending modern learning media with the tried and true plug-in system

Benefits

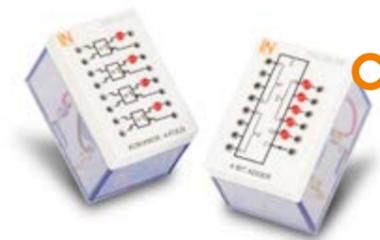
- Virtual measuring instruments for real-time measurements, no external instruments required.
- All power supply units (AC + DC) are integrated and can be controlled in LabSoft.
- PC and modern media boost motivation to study.
- Rapid learning success thanks to structured course guide.
- Skills are acquired thanks to autonomous experimenting.
- Continuous feedback provided through comprehension questions and quizzes.
- Safety ensured thanks to the use of extra-low voltages.

ELOTRAIN 2-MM PLUG-IN MODULES



Plug-in modules

- All components and jumpers (bridging plugs) with gold-plated 2-mm contact plugs.
- Housing made of transparent, extremely robust plastic (polycarbonate).
- The upper part with scratch-proof, contrast-rich silk screen with circuit diagram and component type designation.



Digital technology modules with integrated logic circuits (ICs)

- Digital technology plug-in modules are equipped with 2-mm sockets on their surface for logic switching operations.



Repair / spare housings

- Easy to open housings for repairs.
- Problem-free removal / exchange of defective parts.
- Installation of own special components possible.

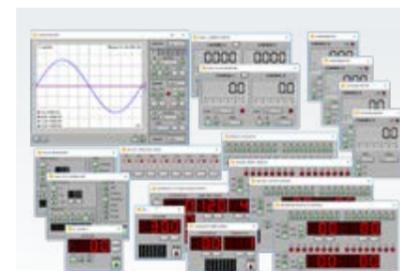
The 2-mm system works in conjunction with the UniTrain-Interface, PC-based measuring instruments and power sources. The tried and true Labsoft learning software guides the student through the experiments deepening an understanding of the underlying theory thanks to numerous animations, graphics and quizzes. It is clearly structured and permits rapid learning progress and also promotes professional skills and media expertise. In combination with UniTrain, the measurement results compiled in the experiments are transferred directly into the LabSoft course and saved for each user specifically.

The active and passive electronic components are connected to the gold-plated 2-mm pin connector plugs of the plug-in modules. When inserted into the experimenter the modules are mechanically latched into place by the pin connector plugs which at the same time establish an electrical connection to the node points on the experimenter. Connections to the power supply, to other node points, components or measuring instruments are carried out using cables or jumpers (bridging plugs). There are three different housing sizes available for electrical, electronic or electromechanical components.



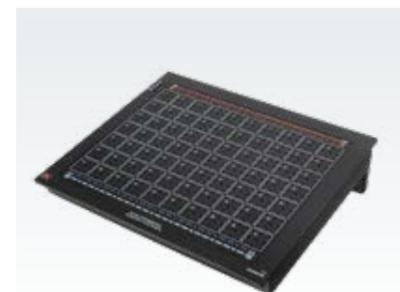
UniTrain-Interface with USB / WIFI

- 4 analog differential inputs for voltage measurement
- 2 analog differential inputs for current measurement
- Sampling rate 100 MSamples
- 9 measurement ranges from 100 mV - 50 V
- 25 time ranges from 100 ns - 10 s
- 16 digital inputs and outputs
- Analog output up to 5 MHz
- 8 relays for fault simulation



Built-in instruments and power supplies.

- Ammeter and voltmeter
- 2-/4 channel storage oscilloscope
- Variable DC power supply source, function and pulse generator
- Three-phase power supplies
- Instruments for digital inputs and outputs
- Relay control



EloTrain experimenter

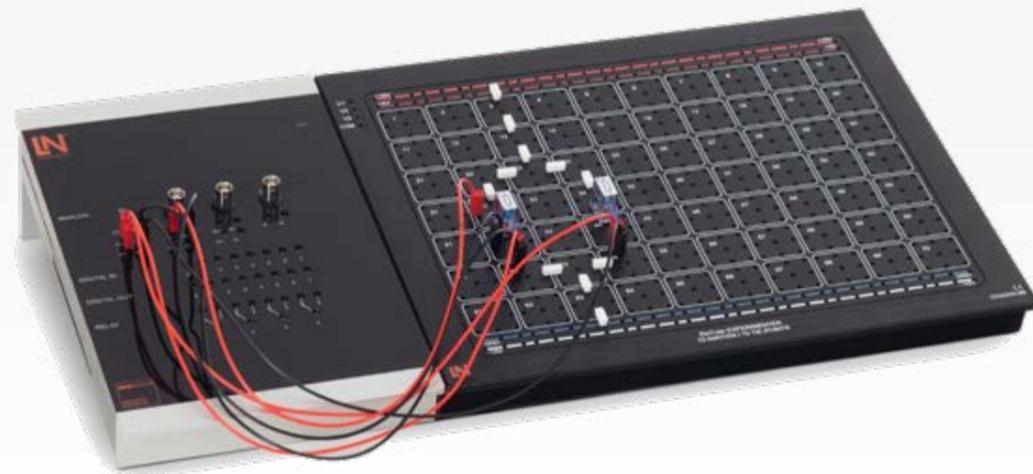
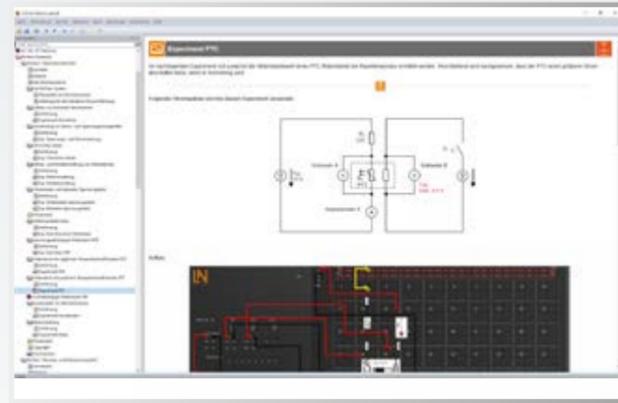
- Provides fixed and variable voltages at 2-mm sockets for UniTrain
- 4 power supply bus lines (+15 V, +5 V, -15 V, ground)
- Variable three-phase power supply
- 70 nodes (connection points) with 9 x 2-mm sockets
- 7.5-mm raster grid with 2-mm sockets
- Desktop console with ergonomic design



EloTrain 2-mm courses

- Delivered in convenient and robust portable case
- Each case contains the components required to complete the course including LabSoft and the learning program
- Always have the entire plug-in system clearly in view thanks to overlay masks with component imprinted symbols

DC TECHNOLOGY



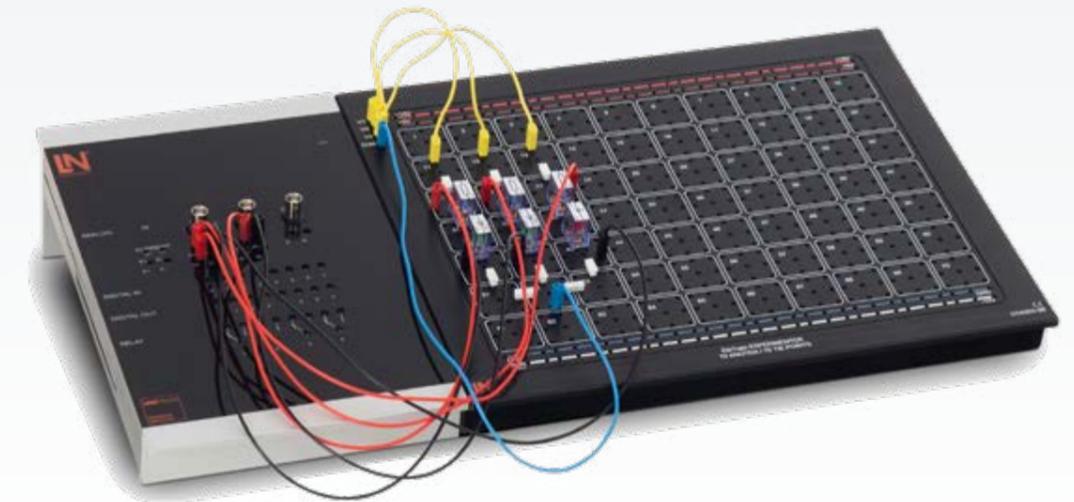
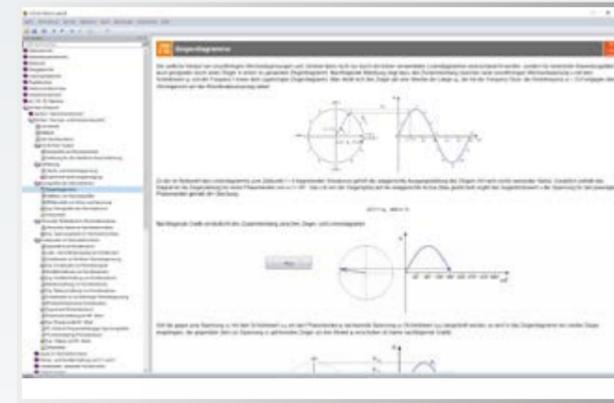
Current, voltage, resistance—learning the basics of electrical engineering with 2-mm plug-in system. In this course, the fundamental laws of electrical engineering are explored in numerous, easily understandable experiments and deepened with knowledge tests.

Training contents

- Design of simple circuits
- Assemble electrical circuits based on circuit diagrams
- Use of ammeters and voltmeters
- Experimentally verify Ohm's law
- Use Kirchhoff's laws on resistors connected in series and parallel configurations
- Voltage measurements across loaded and unloaded voltage dividers
- Examine variable resistors:
 - Voltage-dependent resistor VDR
 - Temperature-dependent resistors: NTC, PTC
 - Light-dependent resistor LDR
- Capacitors in DC circuits:
 - Recording charging curves
- Design of a relay circuit

Order no. C4206-1A

AC AND THREE-PHASE TECHNOLOGY



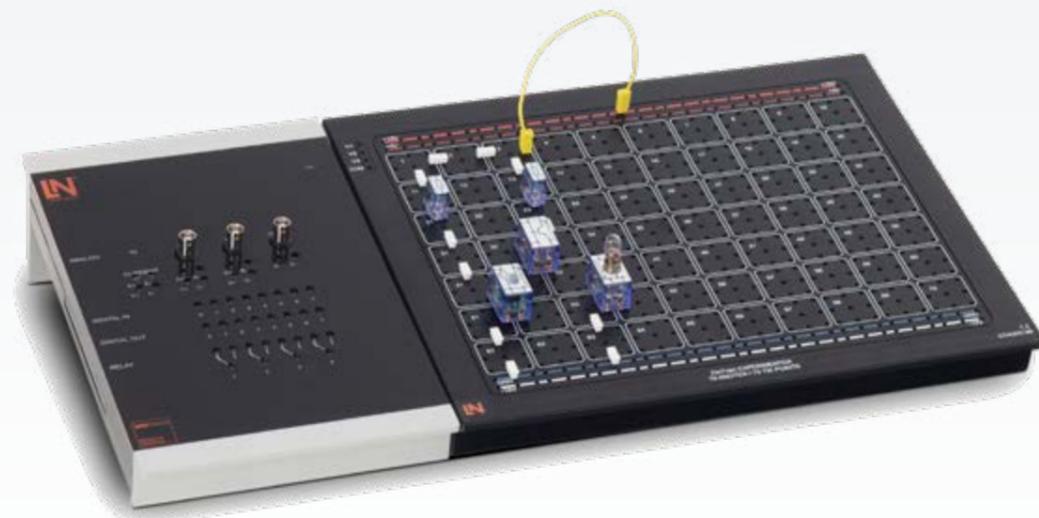
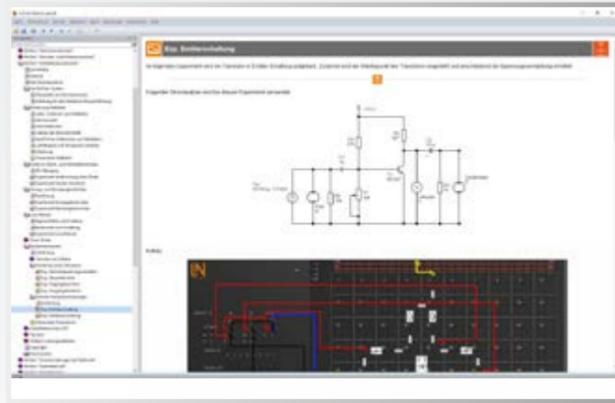
How do coils and capacitors respond to alternating current? What is a resonant circuit and how does a transformer work? These topics and many more are imparted in a multitude of experiments that make them easy to understand for students.

Training contents

- Be able to explain the difference between DC and AC voltage
- Name the parameters of alternating current
- Calculate using alternating current variables
- Ohmic resistance in the AC circuit
- Experiment-based investigation of capacitors and coils in an AC circuit:
 - charging and discharging process
 - response to alternating voltage
 - reactance, phase angle between current and voltage
 - parallel and series circuit, resonant circuit
 - filter circuits with RC, RL and RLC elements
- Measurements on a transformer with and without load
- Be able to explain how three-phase power is generated
- Design and investigation of star and delta circuits with balanced and unbalanced loads

Order no. CO4206-1B

SEMICONDUCTOR COMPONENTS



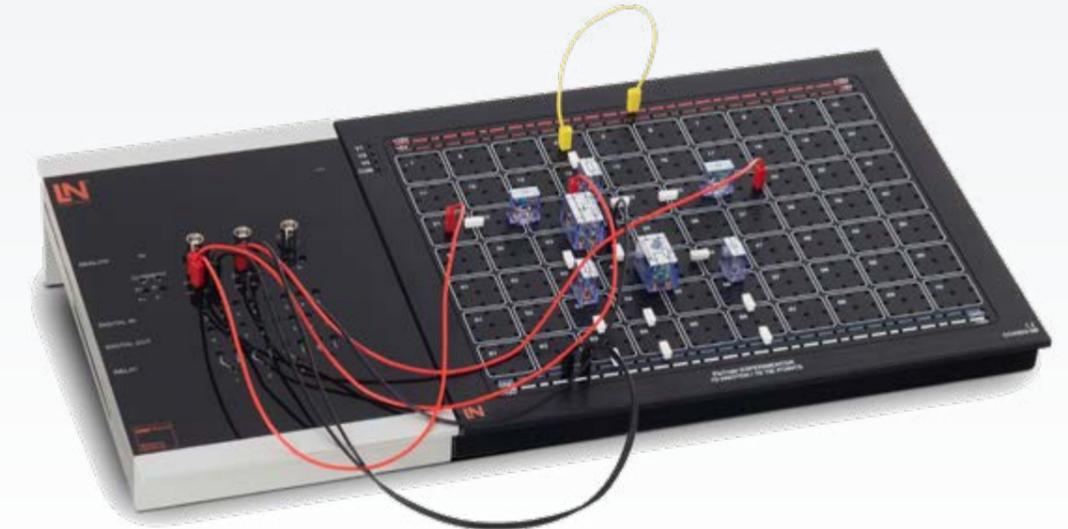
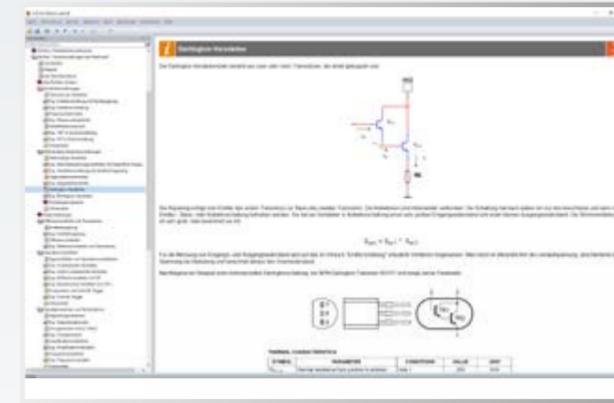
Knowing the properties and functions of electronic components is fundamental to an understanding and analysis of electronic circuits and ICs.

Training contents

- Recording diode characteristics
- Experiment-based examination of diode operation in reverse and forward direction
- Investigation of half-wave and bridge rectifier circuits
- Determine the effect of filtering circuits and loads experimentally
- Determine the function and parameters of LEDs and Zener diodes experimentally
- Find out how bipolar transistors operate
- Record gate control, input and output characteristics
- Perform measurements at the emitter and collector circuit
- Design and operation of field effect transistors
- Record input and output characteristics of FETs
- Investigate circuits equipped with thyristors, diacs and triacs

Order no. CO4206-1C

BASIC ELECTRONIC CIRCUITS



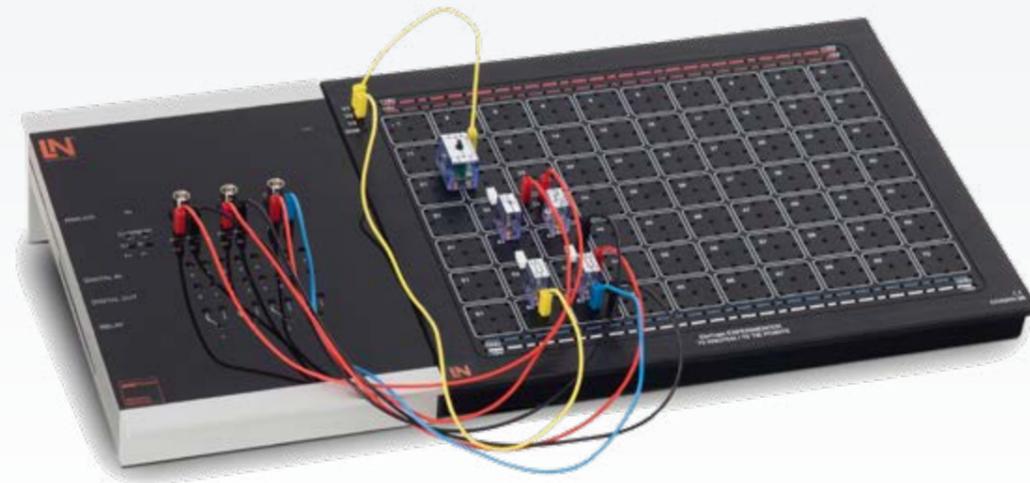
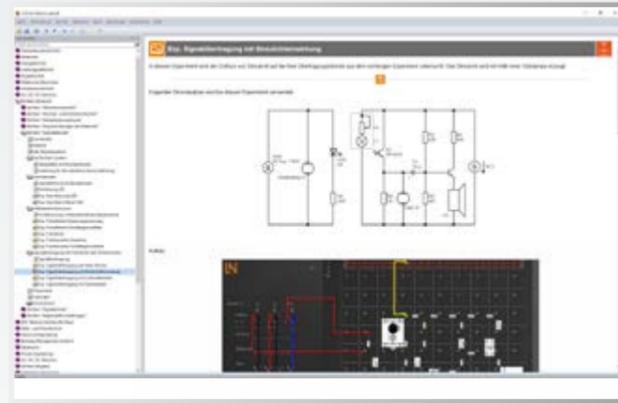
The focal point of this course is a smooth introduction to electronic circuitry and the overall subject. The course first imparts the essential fundamentals so that later a variety of circuits can be assembled, experimented on and measured using original components.

Training contents

- Become familiar with the design and function of multi-staged amplifiers, including calculation and measurement of gain
- Feedback in amplifier circuits: positive and negative feedback
- Explore how other amplifier circuits operate experimentally: Darlington amplifiers, emitter-coupled amplifiers, phase inversion stage, push-pull amplifiers
- Measurements on astable, monostable and bistable flip-flop circuits
- Operational amplifiers: amplifiers, comparators and Schmitt triggers
- Assemble signal generators and modulator circuits and investigate them with measuring instruments: sawtooth generators, sinusoidal generator (Colpitts oscillator) AM and FM modulators
- Find out how full-wave, bridge and three-phase rectifiers work

Order no. CO4206-1D

OPTOELECTRONICS



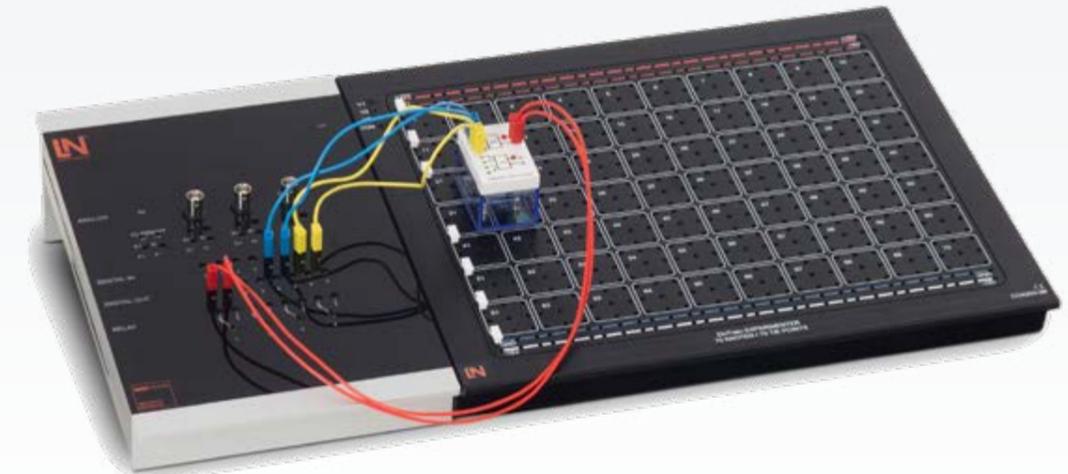
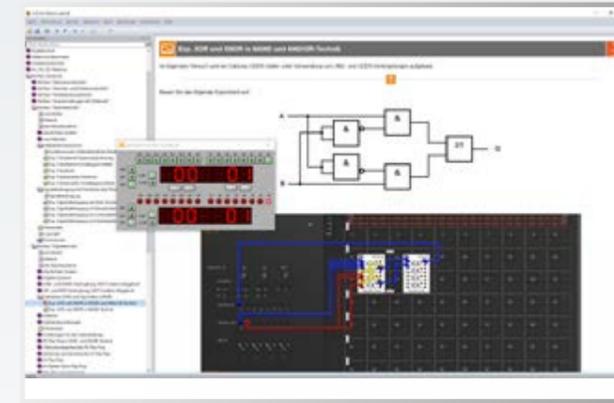
Optoelectronic components are those parts that act as interfaces between electrical and optical components. Optoelectronic components are frequently used as sensors or within the framework of optic transmission lines. They are also used inside electronic circuits to electrically decouple different circuit elements.

Training contents

- Be able to describe the design and function of light-emitting diodes
- Determine experimentally the parameters and characteristics of LEDs
- Determine experimentally how optoelectronic sensors operate:
 - Phototransistors
 - Photoelements
 - Photodiodes
 - Optocouplers
- Be able to describe the principle of signal transmission with optoelectronic components
- Assemble different optoelectronic transmission lines
- Experiment-based investigation of disturbance variables on optical transmission lines

Order no. CO4206-1E

DIGITAL TECHNOLOGY



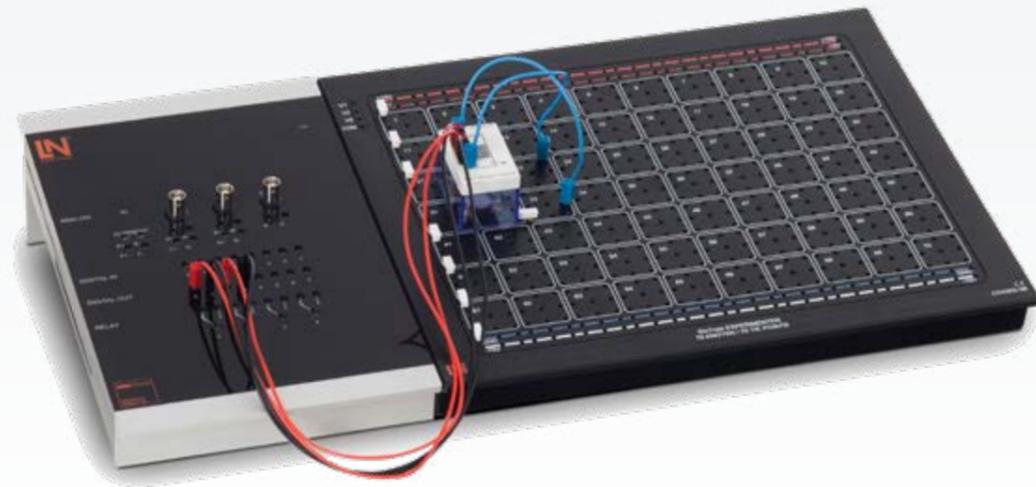
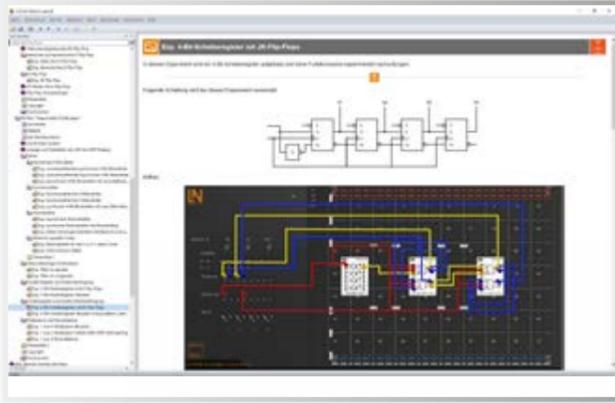
Digital technology involves processing discrete value and time variables and numerical sequences as well as digital signal processing. Digital circuits consist mainly of logic operations like AND, NAND, OR, NOR, NOT, XOR, XNOR and others with which digital 1/0 bits are combined, e.g. within timer or memory modules (flip-flops).

Training contents

- Be able to distinguish between analog and digital variables
- Find out the operating principles of digital circuits
- Become familiar with Boolean algebra and truth tables
- Become familiar with logic gates and their graphical symbols
- Implement basic logic operations AND, OR, XOR with NAND gates
- Learn about the binary number system and be able to use it
- Assemble half and full adder circuits and examine them with measuring instruments
- Find out how flip-flops work
- Assemble and investigate simple flip-flop circuits
- Use pulse diagrams for circuit analysis
- Assemble and investigate application circuits with flip-flops

Order no. CO4206-1F

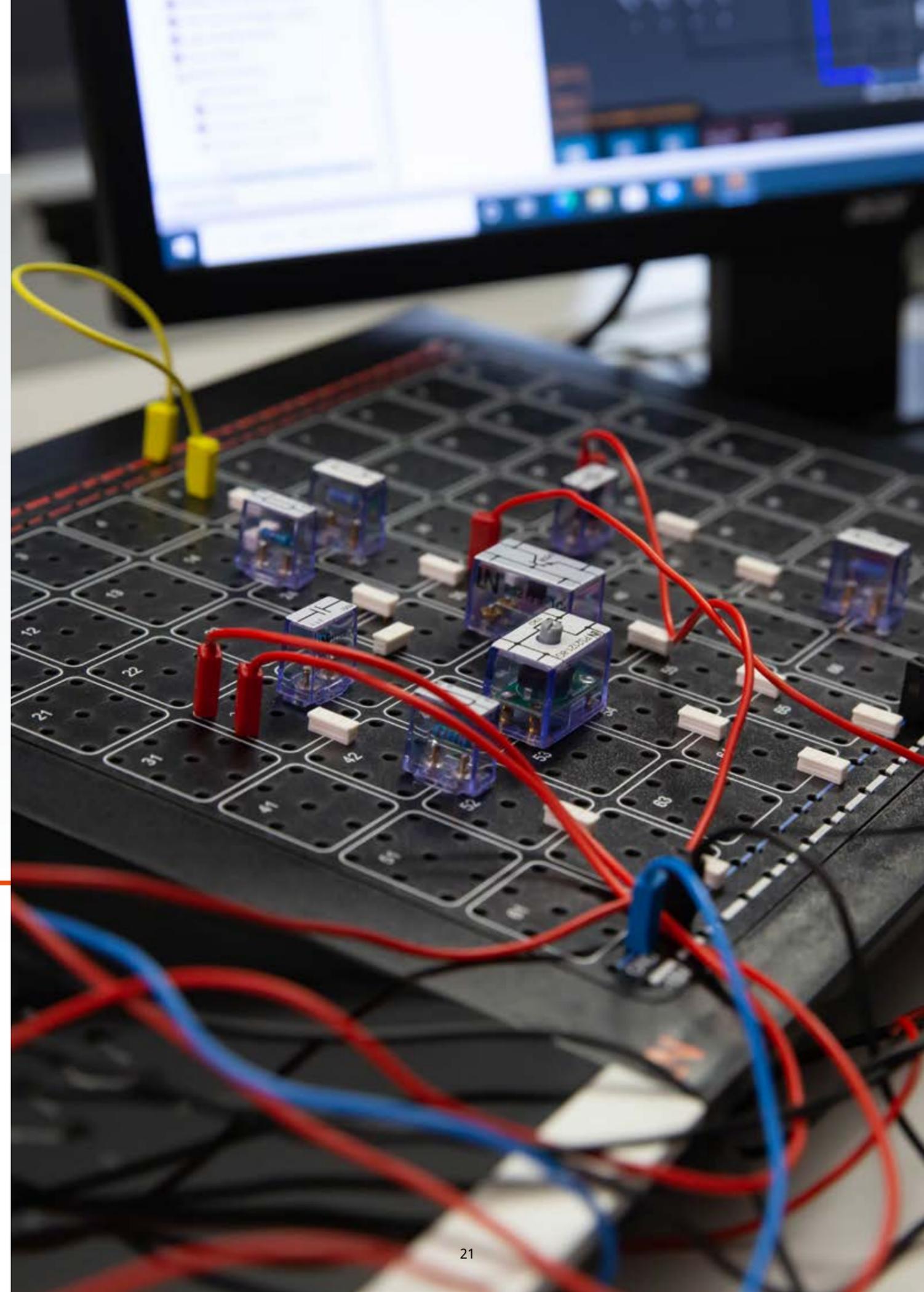
SEQUENTIAL CIRCUITS



Sequential circuits are of paramount importance in computer engineering. Flip-flops and the counters, registers and dividers out of which they are made are the basic building blocks of every microprocessor.

Training contents

- Assemble asynchronous and synchronous counter circuits
- Assemble circuits for up and down counting operations
- Use signal-timing graphs and truth tables for function analysis
- Assemble and test counting circuits using different codes
- Set up and test frequency divider circuits with even and uneven division ratios
- Assemble and test parallel registers with flip-flops
- Assemble 4-bit shift registers with the aid of flip-flops
- Be able to use registers for converting serial into parallel data
- Assemble and put into operation multiplexer and demultiplexer circuits with basic logic gates
- Explain the purpose of and differences between address lines and data lines



4-MM PLUG-IN SYSTEM

Perfectly safe thanks to safety extra-low voltage

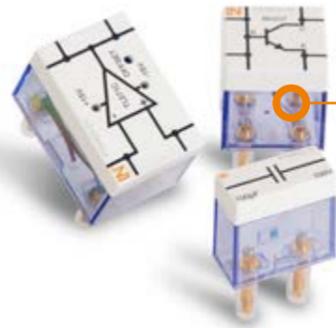


Classic alternative with printed manuals and conventional measuring instruments

Benefits

- Low degree of abstraction thanks to circuit-diagram true assembly on the experimenter
- Experiment-based exploration of how complex circuits work
- Universal power supply with fixed and variable DC, AC and three-phase power supplies, delivered exclusively in safe extra-low voltage (SELV)
- Acquire practical skills through autonomous experimenting
- Rapid learning success thanks to tried and true experiment instructions and information
- Plug-in modules with shock-hazard protected contacts for even more safety

ELOTRAIN 4-MM PLUG-IN MODULES



Plug-in modules

- All components with gold-plated 4-mm pin connectors
- Shock-hazard protected connector plugs
- Robust housings made of transparent polycarbonate
- Top section with scratch-proof, multi-coloured silkscreen print of circuit symbol and component type designation



Digital technology modules with integrated logic circuits (ICs)

- Digital technology plug-in modules equipped with 2-mm sockets on surface for logic element connection

New - shock-hazard protected pin connectors



Repair / spare housings

- Easy to open housings for repairs
- Problem-free removal / exchange of defective parts
- Installation of own special components possible

The 4-mm system uses conventional measuring instruments and power sources. The training contents are imparted with manuals. That way the experiments can be worked through without needing a PC. Here too alternating between theoretical material and hands-on practice provides for motivation and rapid learning success.

The electronic components are connected to the gold-plated 4-mm pin connector plugs of the plug-in modules. For even more safety the connectors are equipped with contact protection. When inserted into the experimenter the modules are mechanically latched into place by the pin connector plugs which at the same time establish an electrical connection to the node points on the experimenter. There are three different housing sizes available for electrical, electronic or electromechanical components.



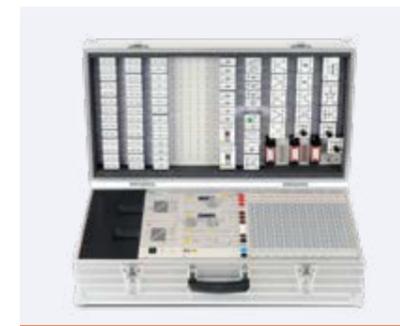
Universal power supply for all experiments

- DC voltage 5 V, 15 V / 12 V switchable, -15 V, 0 - 40 V
- Function generator up to 1 MHz
- AC voltage 12 / 24 V with line (mains) frequency
- Three-phase power supply 1 Hz / 50 Hz
- Short-circuit proof via fuses with automatic reset
- Safety extra-low voltage according to EN61010
- USB port for control operation via PC
- Version suitable for the 19" insert system



4-mm / 2-mm experimenter

- 4 power supply bus lines (+15 V, +5 V, -15 V, ground)
- Variable three-phase power supply
- 120 nodes (connection points) each with 1 x 4-mm and 4 x 2-mm sockets
- 7.5-mm raster grid with 2-mm sockets and 19-mm raster grid with 4-mm sockets
- Space-saving assembly using 2-mm connection plugs
- Desktop console with ergonomic design
- Work is possible using 2-mm and 4-mm modules



Optional carrying case to accommodate a complete experiment system

- Removable cover with storage option for plug-in modules
- Short set-up times: Connect power supply cable and get started
- Stable aluminium case with lockable clasps
- Lockable storage locker for small parts, jumpers and experiment leads

EXPERIMENT SET ELECTRICAL ENGINEERING / ELECTRONICS



Component set in case +



With this equipment set consisting of 82 individual 4-mm plug-in modules, a multitude of electrical engineering and electronics experiments can be set up. In addition to the experiments covered in the "DC technology", "AC and three-phase technology", "Semiconductor elements" and "Basic circuits in electronics" manuals, a vast array of additional circuitry can also be implemented. The set is delivered on a DIN A3 storage board with scratch-proof, coloured imprint.

Scope of supply

- Storage board, printed with the components' graphical symbols
- 29 Resistors 10 Ω - 1 M Ω
- 3 Potentiometers, linear, 100 Ω , 1 k Ω , 10 k Ω
- 4 Variable resistors: 1 NTC, 1 PTC, 1 VDR, 1 LDR
- 13 Capacitors 10 nF - 470 μ F
- 2 Coils, 10 mH and 33 mH
- 3 Transformer coils with 1 strip-wound cut core (1 pair)

- 8 Diodes: 6 silicon diodes, 1 germanium diode, 1 Zener diode
- 3 LEDs
- 5 Bipolar transistors
- 2 Field effect transistors
- 1 Unijunction transistor
- 3 Power semiconductors: 1 thyristor, 1 diac, 1 triac
- 1 Operational amplifier, 1 loudspeaker 1 relay
- 1 Switch, 1 pushbutton, 1 incandescent light socket E10

Order no. PS4400-1A
Order no. PS4400-1B (without storage plate for use in carrying case)

OPTOELECTRONICS SUPPLEMENTARY EQUIPMENT SET



The equipment set consists of 9 single 4-mm plug-in modules and is a supplement to the basic EloTrain equipment set. The supplement permits additional experiments in the area of optoelectronics.

The set is delivered on a DIN A4 storage panel with a scratch-proof, coloured imprint.

Scope of supply

- Storage panel printed with graphical symbols of the components
- 1 IR LED
- 1 LED red
- 1 Photodiode
- 1 Phototransistor
- 1 Photocell
- 1 Optocoupler
- 1 Variable light source
- 2 Brackets for optical fibres
- 1 Fibre optic waveguide

Order no. PS4400-1P

DIGITAL TECHNOLOGY EQUIPMENT SET



Starting with simple circuit combinations involving basic logic gates up to and including register and counter circuits, this equipment set makes it possible to do a host of experiments in digital technology which provide deep insight into the nature and operation of digital circuits.

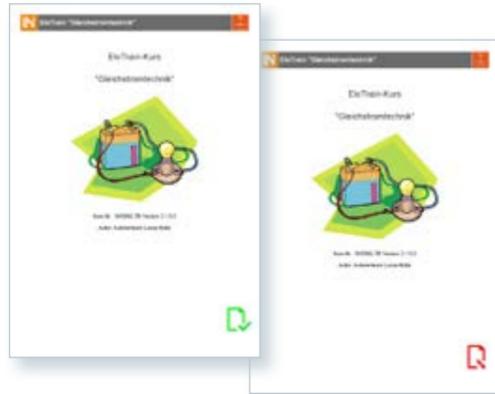
The set is delivered on a DIN A3 storage panel with a scratch-proof, coloured imprint.

Scope of supply

- Storage panel printed with the graphical symbols of the components
- 1 4-bit driver / NOT logic gate
- 1 4-bit input
- 2 AND / NAND logic gates, 4 inputs, 2-fold
- 1 OR / NOR gate, 4 inputs, 2-fold
- 2 AND / NAND gates, 2 inputs, 4-fold
- 2 OR / NOR gates, 2 inputs, 4-fold
- 1 XOR / XNOR gate, 2 inputs, 4-fold
- 2 JK-flip-flops, 2-fold
- 1 JK-MS-flip-flop, 2-fold
- 1 Counter, 4 bit
- 1 Combined AND / OR / NOT gate
- 1 Multiplexer 1 out of 4
- 1 Shift register, 4 bit, 2-fold
- 1 Adder, 4 bit
- 1 Buffer, 4 bit, tristate
- 1 Display, 7 Segment
- 1 Monoflop, 2-fold
- 1 Clock generator

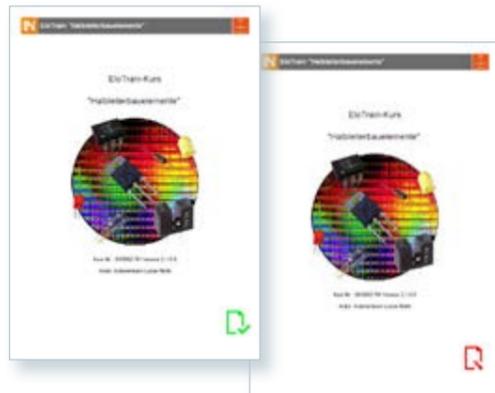
Order no. PS4400-1G

INSTRUCTION MANUALS



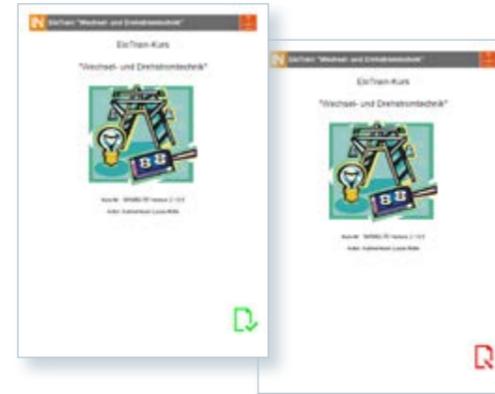
DC technology / Order no. SH5002-7B

- Design of simple circuits
- Assemble electrical circuits based on circuit diagrams
- Use of ammeters and voltmeters
- Verifying Ohm's law using experiments
- Using Kirchhoff's law on resistors connected in series and parallel configurations
- Conducting voltage measurements on loaded and unloaded voltage dividers
- Recording current and voltage characteristics of incandescent light bulb
- Investigating variable resistors: VDR, NTC, PTC, LDR
- Capacitor in a DC circuit: recording charge curves
- Design of a relay circuit



Semiconductor components | Order no. SH5002-7H

- Recording diode characteristics
- Experiment-based examination of diode operation in reverse and forward direction
- Investigating the operating response of half-wave and bridge rectifier circuits
- Learn about the concepts of smoothing and residual ripple
- Determine the effect of filtering circuits and loads experimentally
- Determine experimentally how LEDs and Zener diodes operate and their parameters
- Learn about the design and operation of bipolar transistors and FETs
- Record gate control, input and output characteristics
- Investigate how to set the operating point of emitter and collector circuits using measuring instruments



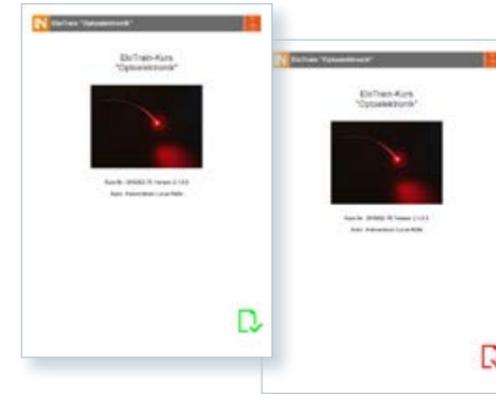
AC and three-phase technology | Order no. SH5002-7D

- Name the parameters of alternating current
- Calculate using alternating current variables
- Ohmic resistance in the AC circuit
- Experiment-based investigation of capacitors and coils in the AC circuit
 - charging and discharging process
 - response to alternating voltage
 - reactance and phase angle between current and voltage
- Parallel and series connection, resonant circuit
- Filter circuits with RC, RL, RLC elements
- Measurements on a transformer with and without load
- Be able to explain how three-phase power is generated
- Design and investigation of star circuits with balanced and unbalanced loads
- Design and investigation of delta circuits with balanced and unbalanced loads



Basic electronic circuitry | Order no. SH5002-7J

- Design and operation of multi-stage amplifiers
- Experiment-based investigation of multi-stage amplifiers with capacitive and electrical coupling
- Be able to measure and calculate the gain of multi-stage amplifiers
- Feedback in amplifier circuits: positive and negative feedback
- Explore experimentally the function of other amplifier circuits: Darlington amplifiers, emitter-coupled amplifiers, phase inversion stage, push-pull amplifiers, differential amplifiers
- Using instrumentation to detect crossover distortions in a push-pull output amplifier
- Set up and conduct measurements on astable, monostable and bistable flip-flop circuits



Optoelectronics | Order no. SH5002-7K

- Be able to describe design and operation of light-emitting diodes
- Determine experimentally the parameters and characteristics of LEDs
- Determine experimentally how optoelectronic sensors operate:
 - Phototransistor
 - Photocell
 - Photodiode
 - Optocoupler
- Be able to describe the principle of signal transmission with optoelectronic components
- Design of different optoelectronic transmission lines
- Experiment-based investigation of disturbance variables on optical transmission lines



Sequential circuits | Order no. SH5002-8D

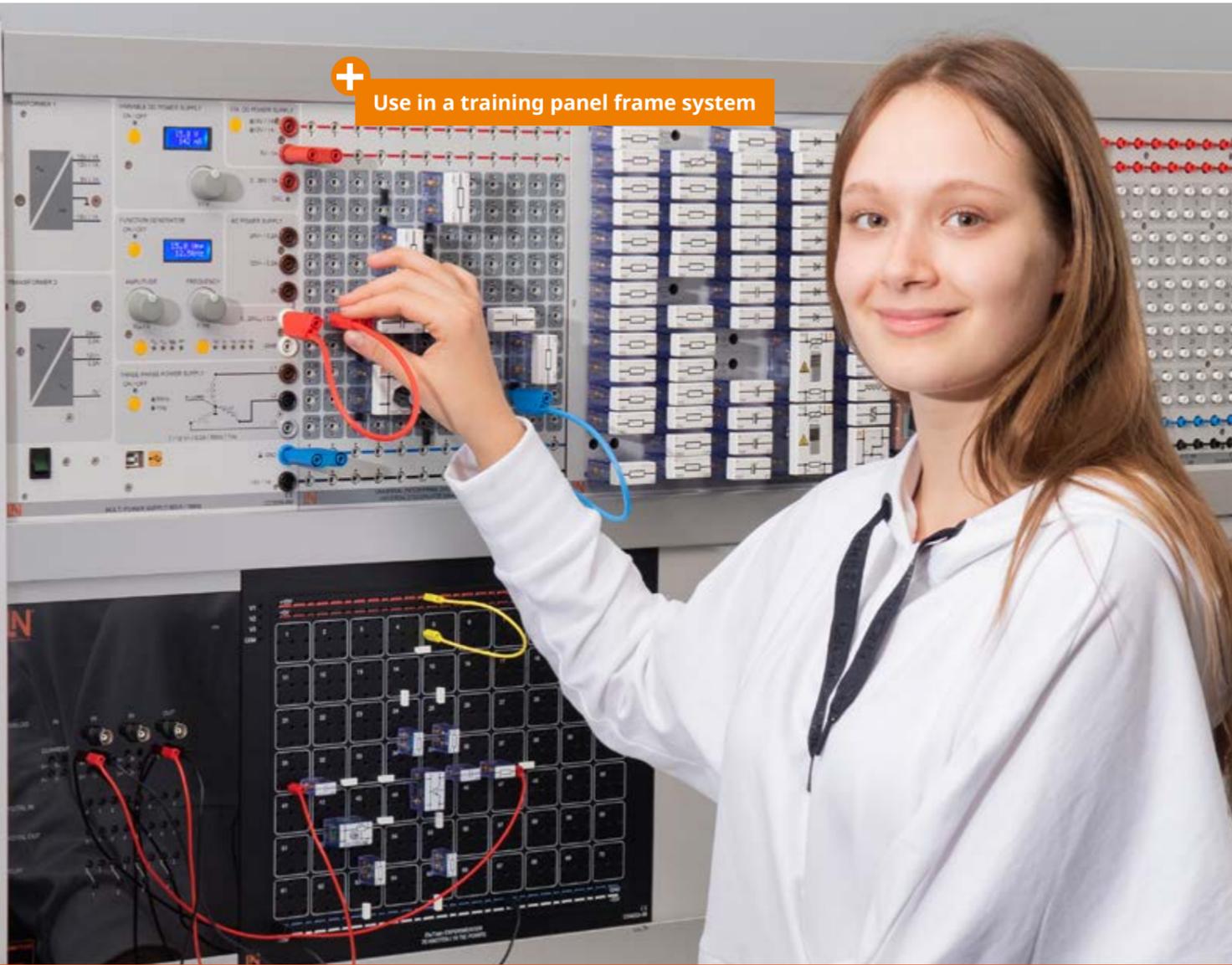
- To explain the difference between asynchronous and asynchronous counters
- Assemble asynchronous and synchronous counter circuits with flip-flops or counter ICs
- Assemble circuits for up and down counting operations
- Use signal-timing diagram truth tables for functional analysis
- Assemble and test counting circuits using different codes
- Be able to explain the differences between counter and frequency divider circuits
- Set up and test frequency divider circuits with even and uneven division ratios
- Assemble and test parallel registers with flip-flops



Digital technology | Order no. SH5002-8B

- Be able to distinguish between analog and digital variables
- Find out the operating principles of digital circuits
- Become familiar with Boolean algebra and truth tables
- Become familiar with logic gates and their graphical symbols
- Assemble simple logic circuits with basic digital functionality
- Learn about the binary number system and be able to use it
- Assemble half and full adder circuits and examine them with measuring instruments
- Assemble circuits for the conversion of various binary codes and determine experimentally how they function
- Be able to name the differences between RS, D and JK flip-flops
- Assemble and investigate flip-flop circuits
- Be able to explain the difference between clocked and unclocked flip-flops
- Use a signal-time graph (pulse timing diagram) to analyze the circuit

ONE SYSTEM - A MULTITUDE OF POTENTIAL APPLICATIONS



+ Use in a training panel frame system

The EloTrain system provides every opportunity to save critical classroom space. Both the 2-mm system with UniTrain and the 4-mm system can be operated as a desktop system on the tabletop or vertically in training panel frames. The 4-mm system can also be put into operation directly inside the carrying case.

Benefits

- Totally flexible
- For the lab or the classroom
- High mobility
- Short set-up times



+ Keep mobile using the carrying case

+ or use as desktop device

ACCESSORIES



Multi-power supply

- Regulated DC power sources: 5 V, 15 V / 12 V switchable, -15 V, 1 A
- Adjustable DC power source 0 - 30 V, 1A with adjustable current limiting (1 - 1000 mA, off)
- Function generator
 - Signal shape: sinusoidal, triangular, square-wave, TTL
 - Frequency range: 0.5 Hz - 1 MHz
 - Amplitude: 0 - 20 Vpp, 300 mA
- AC power sources 12 / 24 V, 400 mA with line (mains) frequency
- Three-phase power source 1 Hz / 50 Hz, 7 / 12 V, 3 x 200 mA
- Short-circuit proof using automatic reset fuses
- Safety extra-low voltage according to EN61010
- USB port for PC operation

Order no. CO3538-8M



Multi-power supply for insertion into power console duct

- Regulated DC power sources: 5 V, 15 V / 12 V switchable, -15 V, 1 A
- Adjustable DC power source 0 - 30 V, 1A with adjustable current limiting (1 - 1000 mA, off)
- Function generator
 - Signal shape: sinusoidal, triangular, square-wave, TTL
 - Frequency range: 0.5 Hz - 1 MHz
 - Amplitude: 0 - 20 Vpp, 300 mA
- AC power sources 12 / 24 V, 400 mA with line (mains) frequency
- Three-phase power source 1 Hz / 50 Hz, 7 / 12 V, 3 x 200 mA
- Short-circuit proof using automatic reset fuses
- Safety extra-low voltage according to EN61010
- Remote control option via Sybanet

Order no. ST8008-6K



Digital multimeter

- 3 3/4-digit multimeter; resolution $\pm 4,000$ digits
- Measurement category CATII - 1000 V
- Voltage measurement range: 400 mV - 1000 V DC / AC
- Current measurement range: 40 μ A - 10 A DC / AC
- Resistance range: 100 mOhm - 40 MOhm
- Capacitance measurement 1 pF - 200 μ F
- Frequency measurement 0.001 Hz up to 500 kHz
- Continuity and diode test
- Automatic range selection and battery switch-off, min / max and data-hold function

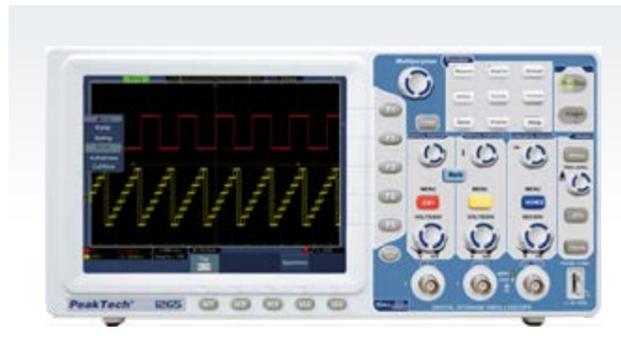
Order no. LM2332



Measurement lead and connector (jumper) set

- 1 x safety measurement lead 4 mm, 50 cm, red
- 1 x safety measurement lead 4 mm, 50 cm, black
- 12 x measurement leads 2 mm, 15 cm, blue
- 12 x measurement leads 2 mm, 15 cm, yellow
- 2 x measurement leads 2 mm, 45 cm, black
- 2 x measurement leads 2 mm, 45 cm, red
- 2 x measurement leads 2 mm, 45 cm, blue
- 60 x bridging plugs (jumpers) 2 mm / 7.5 mm, black
- 8 x safety bridging plugs (jumpers) 4 mm / 19 mm

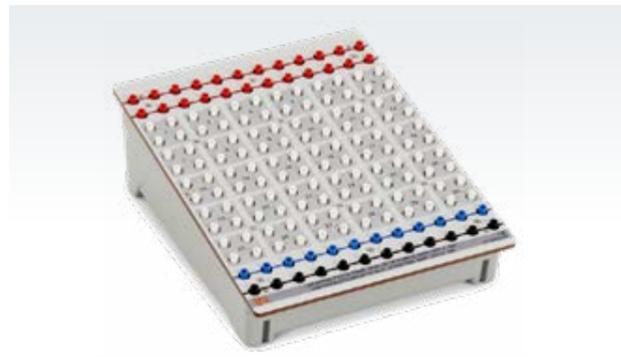
Order no. SO5146-1M



2-channel storage oscilloscope

- Bandwidth 25 MHz / 100 MS/s
- Maximum input voltage 300 V
- LCD colour display with high resolution and background illumination
- 5 automatic measurement functions with measurement data memory and curve selection
- USB port for transfer of greater data volumes
- Safety in compliance with EN 61010-1

Order no. LM6210



Experimenter 4 mm

- 4 power supply bus lines (+15 / 12 V, +5 V, -15 V, ground)
- 30 nodes (connection points) each with 4 x 4-mm sockets, 19-mm raster grid
- Cascadable
- Ergonomic console housing design

Order no. CO3535-5X



UniTrain storage case

- Storage capacity for 1 interface, 1 EloTrain 2-mm experimenter, 1 power supply, cables and miscellaneous
- Stable aluminium case with lockable clasps

Order no. CO4203-2Y



Storage case

- Storage case to accommodate an entire experiment system
- Space for one power supply and one experimenter
- Removable cover with storage option for plug-in modules
- Stable aluminium case with lockable clasps
- Lockable compartment for loose items (e.g. bridging plugs, experiment cables)
- Alternatively available: a case for a power supply and two experimenters (Order no. CO5127-3U)

Order no. CO5127-3L



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