Fundamentals of Electrical Engineering

TP 1010



Basic electrical engineering
Can you limit your training to DC and AC technology now and in the future? Then this equipment set, with the small Combiboard Fundamentals EduTrainer and a reduced range of components, is an economical alternative to TP 1011.

A basic knowledge of circuits is becoming more important for many of occupations to understand functions and processes in complex systems.

The examples used by the training package Fundamentals of Electrical Engineering are taken from this field. The learning objectives include the electrical variables and their relationships with each other. With the project-based exercises, the content can be clearly taught through theory and practical tests. Measurements illustrate relationships, and promote understanding and in-depth learning.

The component set contains all of the components for carrying out basic exercises for DC and AC technology. The clearly labeled slots of the storage panel provide order and structure.

Training content

- **Direct current technology**
  Voltage, current, resistance, conductance, Ohm's law, using measuring devices, energy and capacity, series and parallel connections, voltage dividers, non-linear resistors, bridge circuit, voltage source
- **Alternating current technology**
  Electric field, induction, capacitor and coil in DC and AC circuit, series and parallel connection, active resistance, reactance and impedance, phase shift of current and voltage



On the safe side!
The system is completely equipped with safety plugs and sockets based on state-of-the-art technology.

This applies for all electrical connections - whether on the components or on the Combiboard. The equipment set is therefore ideal for use in any laboratory, even if there are high voltages present. Safety first!

Complete equipment set TP 1010	**8023958**

The most important components at a glance:

1	1x Combiboard Fundamentals EduTrainer	571810
2	1x Set of components for electrical engineering	8005374
3	1x Safety jumper plugs, 28 pieces, grey-black	571809

Necessary accessories, also order:

IEC power cable (→ page 28)
4 mm Safety laboratory cables (→ page 91)
2x Digital multimeter (→ page 34)
Digital storage oscilloscope (→ page 33)

Possibilities of expansion:

Equipment Set TP 1022 Installation and Relay Technology (→ page 16)	
Equipment Set TP 1025 Motor Vehicle Mechatronics (→ page 17)	
A4 Transport and Storage Case (→ page 31)	8197368
PSU Remote Software	574179

1



2



3



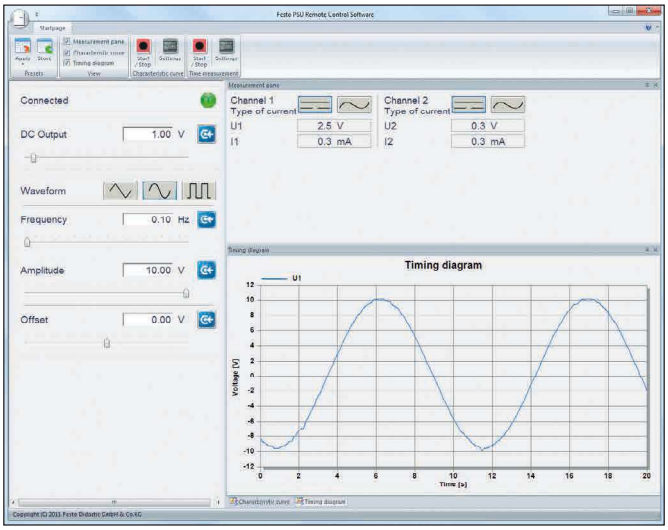
PSU Remote Software

The setting and measurement software for TP 1010, TP 1011 and TP 1011 M

Basic functions:
- Setting the variable DC output
- Setting the signal shape, frequency, amplitude and offset of the frequency generator
- Saving and recalling parameter sets

Also with the built-in measuring module on the power supply unit:
- Direct measured value indicator for voltage and current inputs
- Recording of measured values over time
- X-Y comparison of measured values
- Automatic curve recording with configurable DC voltage output

USB cable with angled USB plug on power supply side, length: 2 m



Recommended Learning Material

Workbooks (→ page 162)



Fundamentals of Direct Current Technology

Campus license:

de	567207
en	567209
es	567211
fr	567213

Fundamentals of Alternating Current Technology

Campus license:

de	567215
en	567217
es	567219
fr	567221

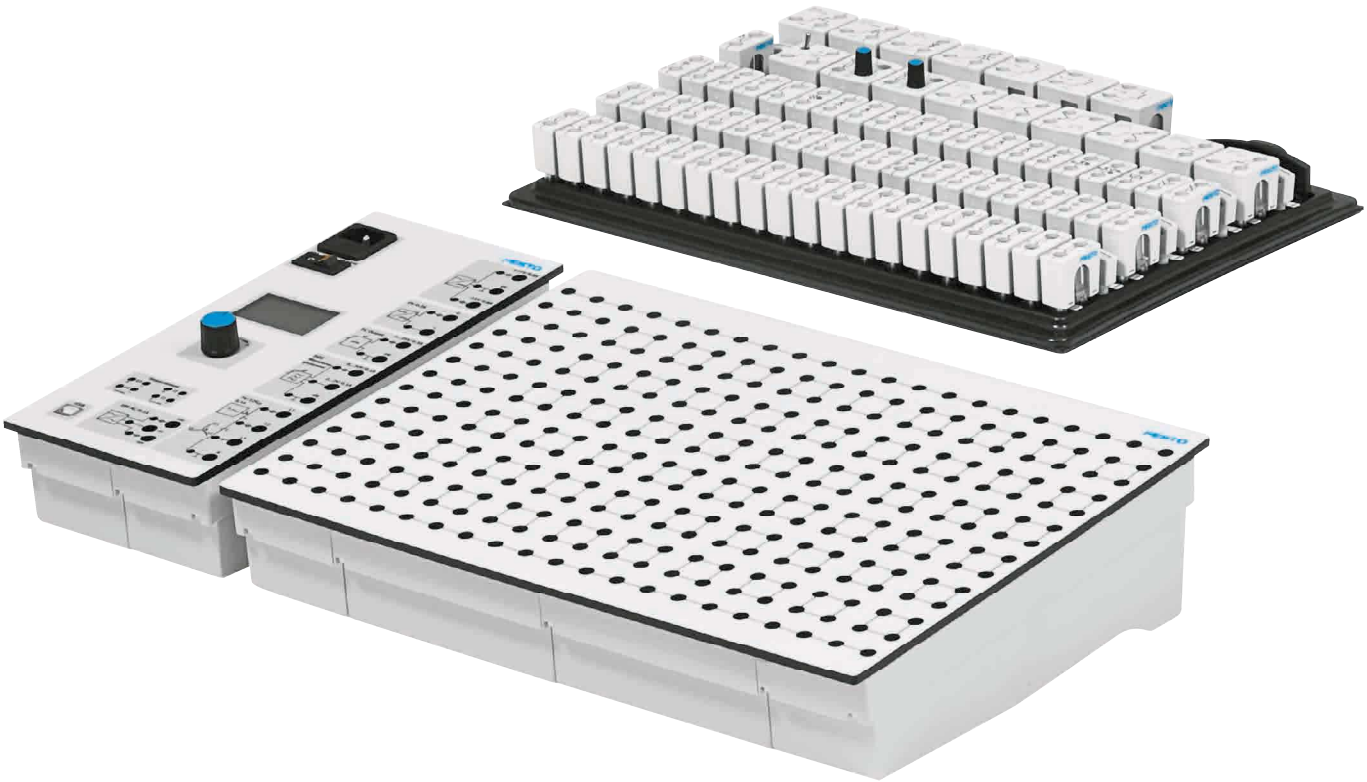
Note: Campus licenses include the PDF version of sample solutions, educational instructions, and worksheets for learners.

Courses on Festo LX

→ Fundamentals of DC Technology
→ Fundamentals of AC Technology

Fundamentals of Electrical Engineering and Electronics

TP 1011



The basis of everything
The universal patch panel of this training package uses the proven 19 mm grid. The universal patch panel and basic power supply unit, which includes a function generator, form the basis on which the digital and control technology component sets can also be used.

With the component set, all basic exercises of DC, AC and semiconductor technology can be performed and basic electronic circuits can be examined. The storage panel, with its clearly labeled slots, provides order and structure.

The equipment set variant TP 1011 M additionally contains a measuring module integrated in the power supply unit and the necessary measuring leads, adapters, and the PSU Remote software.

Training content

- **Direct current**
  Voltage, current, resistance, conductance, Ohm's law, using measuring devices, energy and capacity, series and parallel connections, voltage dividers, non-linear resistors, bridge circuit, voltage source
- **Alternating current**
  Electric field, induction, capacitor and coil in DC and AC circuit, series and parallel circuits, active resistance, reactance and impedance, phase shift of current and voltage
- **Semiconductors**
  Semiconductor diode, Zener diode, LED, bipolar transistors, unipolar transistors, diac, triac, thyristor
- **Basic electronics circuits**
  Transistors and basic circuits, multi-level amplifiers, power amplification, differential and direct current amplifier, impulse and saw tooth generators, sine wave generators, power supply unit circuits



On the safe side!
The system is completely equipped with safety plugs and sockets based on state-of-the-art technology.

This applies to all electrical connections – whether on the components or devices. The equipment set is therefore ideal for use in any laboratory, even if there are high voltages present. Safety first!



Easy to connect!
Safety plugs at the bottom, safety sockets at the top – each component has double the connections.

As a result, measurements can be taken at any time without having to modify the circuit, and parallel connections are easy to establish.

Complete equipment set TP 1011		**571780**

The most important components at a glance:

1	1x EduTrainer basic power supply unit without integr. measuring module	576624
2	1x Universal patch panel EduTrainer	567322
3	1x Component set for electrical engineering/electronics	567306
4	1x Safety jumper plugs, 28 pieces, grey-black	571809
5	FluidSIM-Electrical Engineering (→ page 158)	

Complete equipment set TP 1011 M		**8029635**

The most important components at a glance:

1	1x EduTrainer basic power supply unit with integrated measuring module	567321
2	1x Universal patch panel EduTrainer	567322
3	1x Component set for electrical engineering/electronics	567306
4	1x Safety jumper plugs, 28 pieces, grey-black	571809
	4x 2 mm Safety laboratory cables, 500 mm, red	576295
	4x 2 mm Safety laboratory cables, 500 mm, blue	576296
	8x 4 mm – 2 mm safety measuring adapter	8023960
	1x PSU Remote Software (→ page 13)	

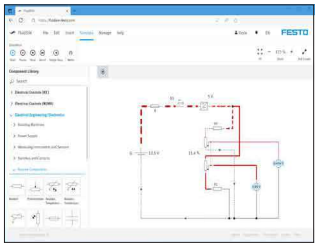
Necessary accessories, also order:

IEC power cable (→ page 28)	
4 mm Safety laboratory cables (→ page 91)	
2x Digital multimeter (→ page 34)	
Digital storage oscilloscope (→ page 33)	

Possibilities of expansion:

Set of Components for Digital Technology (→ page 19)	
Set of Components for Control Technology (→ page 21)	
Equipment Set TP 1022 Installation and Relay Technology (→ page 16)	
Equipment Set TP 1023 Optoelectronics (→ page 16)	
Equipment Set TP 1024 Analog Technology (→ page 17)	
Equipment Set TP 1025 Motor Vehicle Mechatronics (→ page 17)	
Operational Amplifier (→ page 32)	576621
A4 Transport and Storage Case (→ page 31)	8197368

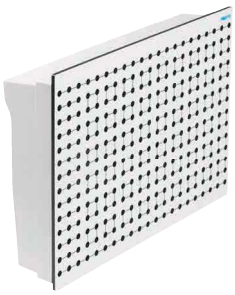
Simulation software FluidSIM
The schematics of the workbooks are included in the library of the simulation software FluidSIM, which allows learners to gain hands-on experience by simulating, testing, and troubleshooting circuits at their own pace, bridging the gap between theory and application while fostering independent learning. More about FluidSIM on page 158.



1



2



3



4



5



Recommended Learning Material

Workbooks (→ page 162)

Fundamentals of Direct Current Technology
Campus license:

de	567207
en	567209
es	567211
fr	567213

Fundamentals of Alternating Current Technology
Campus license:

de	567215
en	567217
es	567219
fr	567221

Fundamentals of Semiconductors
Campus license:

de	567281
en	567283
es	567285
fr	567287

Basic Electronics Circuits
Campus license:

de	567289
en	567291
es	567293
fr	567295

Note: Campus licenses include the PDF version of sample solutions, educational instructions, and worksheets for learners. Printed workbooks available upon request.

Courses on Festo LX
- → Fundamentals of DC Technology
- → Fundamentals of AC Technology
- → Fundamentals of Semiconductors
- → Basic Electronics Circuits