

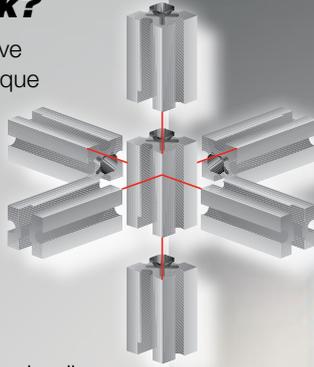
ENGLISH

Building Blocks For Life



What is fischertechnik?

fischertechnik is the flexible and innovative construction system built around the unique fischertechnik building block, which allows attachment to all six sides.



fischertechnik – the building blocks to an engaging STEM education program

These days it seems everywhere you turn, leading educators are stressing the importance of STEM (Science, Technology, Engineering and Mathematics) Education, and the reason for this is simple. Demand for scientists and engineers is expected to grow at a rate far exceeding any other occupational field. At the same time fewer and fewer students are pursuing careers in these areas. When they are, they are often not performing at a sufficient level of academic achievement to be successful. While most schools do address the areas of Science and Math to varying degrees, the two aspects of the STEM education equation that are most often overlooked are the “T” and the “E” – technology and engineering. To help close this gap, you need materials that allow you to provide an engaging, hands-on introduction to technology and essential STEM related concepts. **You need fischertechnik.**



ROBOTICS

State-of-the-art Robotics Sets from Elementary level up to College and University level

Page 8–11



STEM KITS

Various Science and Technology Kits

Page 12–17





fischertechnik's innovative instructional material teaches basic technical understanding and provides optimum preparation for technical occupations.

The fischertechnik learning products are used extensively from Grades 3 to 12 around the globe to explore STEM concepts such as:

- **Simple Machines**
- **Mechanics**
- **Statics**
- **Pneumatics**
- **Renewable Energies**
- **Fuel Cell**
- **Optics & Lights**
- **Electronics**
- **Physics**
- **Robotics**
- **Mechatronics**

fischertechnik is also widely used in industry for vocational training, as well as simulation purposes for realistic representation and simulation of complex systems.

STEM SETS

Project-based STEM SETS
with Standards-based STEM
curriculum

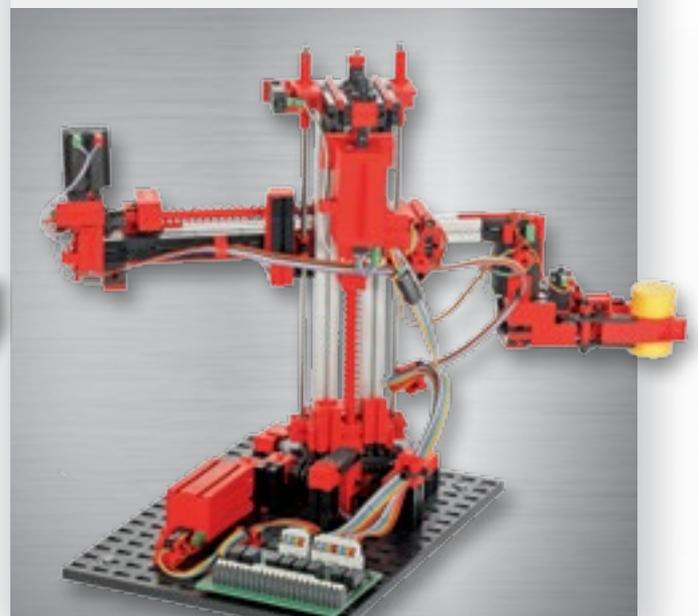
Page 18–19



TRAINING MODELS

Pre-assembled industrial type of
simulation models in 9V and 24V for
Vocational Training and Higher Education

Page 20–21



➤ **PRINCIPLES OF MECHANICS AND STATICS:**

Effect of forces on bodies / objects, dynamics, structural analysis, etc.



➤ **PRINCIPLES OF RENEWABLE ENERGIES:**

Production, storage and utilization of electrical power from water, wind and sun.
Other energy sources:
Fuel cells



➤ **PRINCIPLES OF PNEUMATICS:**

Generation and distribution of compressed air and control of pneumatic cylinders, etc.



➤ **PRINCIPLES OF OPTICS
AND LIGHTS:**

Light refraction,
reflection,
light and shadow,
fiber-optics,
optical illusions,
etc.



➤ **PRINCIPLES OF
ELECTRONICS:**

Electrical circuits, series,
parallel and three-way
circuits and four-way
circuits, electronic
components
and circuits,
etc.



➤ **ROBOTICS:**
(aka Mechatronics and Computer Science)

Ideal introduction to
programming mobile
and stationary robots.
Instrumentation and
control with aid of
various actuators
and sensors.



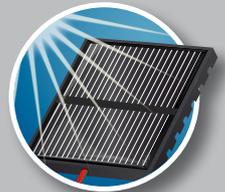
➤ **TEACHING MATERIAL**

How does a gear box work? What is a planetary gear? How is the movement of a windshield wiper produced? How do you design a stable bridge? These questions are answered in the instructional activity booklets in the sets with illustrations and easy-to-understand information.



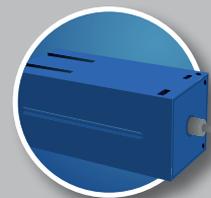
➤ **“GREEN“ COMPONENTS**

- Gold Cap (2.7V / 10F) – electrolytic capacitor for storing electrical energy
- Solar module (1V / 400mA) – generation of electrical power from solar energy
- Reversible fuel cell with integrated hydrogen storage tank
Operation as electrolyzer (2–3V / 8ml / min / 400–1500mA)
Operation as fuel cell (0.5–0.9V / 300mW / 600mA)



➤ **ACTUATORS**

- Motors – generation of motion and propulsion of fischertechnik models
 - XS Motor (9VDC / 5995 rpm / 1.52mNm / 265mA)
 - S Motor (9VDC / 9500 rpm / 4.8mNm / 650mA)
 - S Motor (24VDC / 10700 rpm / 5mNm / 300mA)
 - XM Motor (9VDC / 338 rpm / 84.15mNm / 950mA)
 - Encoder motor (9VDC / 173.5 rpm / 60.29mNm / 465mA)
 - Encoder motor (24VDC / 440 rpm / 176.5mNm / 600mA)
 - Solar motor (2VDC)
- Compressor (9VDC / 0.7bar / 2 l/min / 200mA) – generation of compressed air
- 3/2-way solenoid valve (12VDC / 0.133A) – control of pneumatic cylinder
- White LED (9VDC / 10mA) and Rainbow LED (9VDC / 10mA)
- Lens tip lamp for light barrier (9VDC / 150mA)
- Reflector lamp for light barrier (24VDC / 30mA)



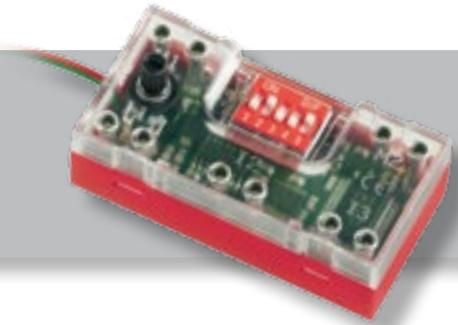
➤ **SENSORS**

- USB color camera (1 MP) – recognition of color, motion, trail and ball
- NTC resistor (1.5kΩ / 450mW) – temperature measurement
- IR trail sensor (2 digital outputs 9V) – trail recognition
- Color sensor (signal: analog 0–9VDC) – color recognition
- Ultrasonic distance sensor (9VDC / distance 3cm–3m) – distance recognition
- Photo resistor (LDR03, R100=1.2kΩ) – for measuring brightness
- Mini-switch (for use as NC (normally closed) and NO (normally open) switch) – touch sensor
- Phototransistor for light barrier (35V)
- Reed contact – magnetic sensor
- Potentiometer (0–4.7kΩ) – rotating resistor



➤ **ELECTRONICS MODULE**

- Electronic control for models with 16 fixed programs
- 3 analog inputs
- 2 motor outputs



➤ **BEGINNER LEVEL**

LT Controller

- Processor – 8bit
- USB interface – also serves as power supply
- 3 analog inputs for sensors
- 2 outputs for actuators

Software ROBO Pro Light

- Simple and easy-to-understand graphic programming



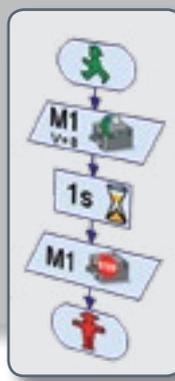
➤ **ADVANCED LEVEL**

TXT Controller

- Dual Processor – 32bit / 600MHz
- 128 MB RAM, 64 MB flash
- Color 2.4" touch display
- Integrated loudspeaker
- Micro SD card reader – for expansion of storage capacity
- USB host port – for USB color camera, USB sticks etc.
- Bluetooth / WLAN connectivity
- Connection to Smartphone / Tablet PC
- 8 Universal inputs – digital / analog 0-9VDC, analog 0-5 kΩ
- 4 high speed counter inputs – digital, frequency up to 1kHz
- 4 motor outputs – 9V / 250mA (max: 800mA); infinitely controllable speed

Software ROBO Pro

- Simple “drag & drop” programming with graphic flow charts
- Use of various software modules
- Creation of teach-in programs
- Interactive introduction to programming with ROBO Pro





➤ **ROBOTICS: BEGINNER**

200


12
Models

Instrumentation and Control (I&C)

Simple introduction to the world of robots. With over 200 components and the aid of sensors (phototransistor, mini-switches) and actuators (XS motor, indicator lights), school children can construct 12 easy-to-understand models such as a hand dryer, stamping machine, lighthouse with blinking light, merry-go-round or automatic sliding door. The ROBO LT Controller with 3 inputs for sensors and 2 outputs for motors or indicator lights has a USB interface which serves simultaneously for power supply. The ROBO Pro Light software makes quick programming easy as pie. The graphical user interface (GUI) provides an ideal introduction for little programmers. Programming is accomplished by completing flow charts. The detailed didactic activity booklet supports the learning process for school children making programming easy to understand.

Main subjects:

Instrumentation and control / programming / interaction between hardware and software / use of actuators and sensors

- > Incl. instructional activity booklet
- > Incl. ROBO LT Controller (USB interface / USB power supply)
- > Incl. ROBO Pro Light control software
- > Incl. XS motor, 2x lights, lens tip lamp phototransistor, 2x mini-switches



Item No.	53 3015	EAN	4048962220728
Models	12	Components	200
Dim. (mm)	440 x 315 x 80	Weight (g)	2308

(US version: Introduction to STEM II – Item No.: 53 3507)

➤ **ROBOTICS: ADVANCED**

310
14
Models

Instrumentation and Control (I&C)

Professional introduction to the world of robots. Robotics set with over 300 components, high performance ROBOTICS TXT Controller, ROBO Pro graphic programming software for control of mobile and stationary robot models and camera for USB or WiFi image transfer, color recognition, line tracing and detection of motion. The TXT controller has the following features: Dual processor ARM Cortex A8 (32 bit / 600 Hz) + Cortex M3, color 2.4" touch display, combined WLAN / Bluetooth module, Micro SD card slot for additional memory space, IR receiver diode, integrated loud speaker, 4 motor outputs, 8 digital / analog inputs for sensors and 4 high speed numerical inputs. Completed program modules are also provided for beginners. Including instructional information material for support of construction and programming. Additional sensors and actuators such as encoder motors, XS motor, mini-switches, NTC resistors, phototransistors and LED's allow construction of mobile detection robot, soccer robot, temperature control and many other models! This set is compatible with other Robotics construction sets.

- > **Required: Accu Set**
- > **Incl. ROBOTICS TXT Controller, CD with ROBO Pro control software and related instructional (interactive) material, USB camera (1 MP), 2x encoder motors, XS motor, 2x LED's, 2x mini-switches, phototransistor, NTC resistor**

Main subjects:
Instrumentation and control / programming / interaction between hardware and software / use of actuators and sensors

Item No.	53 3018	EAN	4048962220735
Models	14	Components	310
Dim. (mm)	440 x 315 x 150	Weight (g)	3050



➤ **ROBOTICS TXT CONTROLLER**



The compact ROBOTICS TXT Controller (90x90x25 mm) can be controlled easily with the color 2.4" touch display. The combined Bluetooth / WiFi RF module provides the perfect, wireless interface for numerous applications. The numerous interfaces also include a USB host port for USB sticks and other components such as the fischertechnik USB camera. Integrated Micro SD card slot allows expansion of memory capacity. Controllers can be coupled.

- > **Dual processor ARM Cortex A8 (32bit/600MHz) + Cortex M3**
- > **Memory capacity: 128 MB DDR3 RAM, 64 MB Flash**
- > **Memory expansion: Micro SD card slot**
- > **Display: Color 2.4" touch display (320x240 pixels)**
- > **8 Universal inputs: Digital / analog 0-9VDC, analog 0-5kΩ**
- > **4 High speed numerical inputs: Digital, frequency up to 1kHz**
- > **4 Motor outputs 9V/250mA (max: 800 mA): speed infinitely controllable, short-circuit proof, alternative 8 single outputs for components such as lights, etc.**
- > **Combined Bluetooth / WiFi RF module: BT 2.1 EDR+ 4.0, WLAN 802.11**
- > **Infrared receiver diode: for fischertechnik Control Set transmitter**
- > **USB 2.0 Client: Mini USB port for connection to PC**
- > **USB Host interface: USB-A port for fischertechnik USB camera, USB sticks, etc.**
- > **Camera interface: over USB host, Linux camera driver integrated into operating system**
- > **10-pin male connector for additional inputs and outputs as well as I2C interface**
- > **Integrated loudspeaker**
- > **Integrated real time clock with replaceable buffer battery: for capturing measured values within a defined period of time**
- > **Linux-based, open source operating system**
- > **Programming possible with ROBO Pro, C-Compiler, PC-Library, and many others.**
- > **Link to smartphones / tablet PC's via Bluetooth or WLAN, allowing use as terminals for controller.**
- > **Programming using ROBO-Pro software.**
- > **Power supply: 9V DC socket 3.45 mm or fischertechnik 2.5 mm sockets (for set of rechargeable batteries)**
- > **Required: Accu Set or Power Set**

Item No.	522 429	EAN	4048962179828
Dim. (mm)	225 x 65 x 150	Weight (g)	450

➤ **ROBO PRO SOFTWARE**



Simple Programming

Graphic flow charts consisting of various software building blocks make it easy for beginners to get started programming. Data can be exchanged between software building blocks and subroutine using variables as well as graphical interfaces, allowing program functions to be demonstrated in an understandable manner. Teach-in features and data exchange with other Windows® software make it easy to create programs.

Item No.	93 296	EAN	4006209932964
System	Windows® XP Vista, 7, 8		
Dim. (mm)	210 x 25 x 150	Weight (g)	85

▶ ROBOTICS & ELECTRO-PNEUMATICS

440  4  Models

Instrumentation and Control (I&C)

Ideal introduction to programming realistic electro-pneumatic machines and robots. The subjects of electro-pneumatics and vacuum technology are demonstrated clearly with the aid of fascinating models such as the pinball machine, compressed air motor, color sorting robot for colored parts and ball obstacle course robot. The powerful and compact compressor guarantees a reliable supply of compressed air for the models. The electro-magnetic valves included allow remote control of the models with a PC.

- > **Required: ROBOTICS TXT Controller, ROBO Pro software and 9V / 1A power pack (Accu Set or Power Set)**
- > **Incl. didactic material on CD**
- > **Incl. compressor, mini motor, 2x solenoid valves, optical color sensor, suction cup, 3x cylinders with spring, 2x phototransistors, 2x lens tip lamps, 11x flex-rails**

Main subjects:
Instrumentation and control / programming / interaction between hardware and software / use of actuators and sensors

Item No.	53 3019	EAN	4048962220742
Models	4	Components	440
Dim. (mm)	440 x 315 x 150	Weight (g)	3162



▶ ROBOTICS IN INDUSTRY

510  4  Models

Instrumentation and Control (I&C)

Ideal introduction to programming realistic industrial applications. Four realistic, fully functional industrial robots: High bay storage rack, 3-axis robot and two additional gripper robots. Stable fischertechnik aluminum channels used in all models. The instructional activity booklet provides support in the form of background information, projects and programming tips.

Main subjects:
Instrumentation and control / programming / interaction between hardware and software / use of actuators and sensors

- > **Required: ROBOTICS TXT Controller, ROBO Pro software and 9V / 1A power pack (Accu Set or Power Set)**
- > **Incl. didactic material on CD**
- > **Incl. 2x encoder motors, 2x XS motors, 6x mini-switches**

Item No.	53 3020	EAN	4048962220759
Models	4	Components	510
Dim. (mm)	440 x 315 x 150	Weight (g)	3328





► **ROBOTICS TXT COMPETITION SET**

565


17
Models

Focused on Robotics Competition

The fischertechnik Robotics TXT Competition Set was designed for schools, universities and other educational institutions that want to develop or enhance current mobile robotics competitions for their students. This Robotics TXT Competition Set includes robotic models of online followers, maze, explorers, junior category RoboCup and various other competitions around the world. The fischertechnik Robotics TXT Competition Set will help your students explore robotics and key STEM education principles through project-based learning. The fischertechnik Robotics TXT Competition Set includes 565 pieces, among which are structural components gears, pulleys, endless, DC motors, motors with integrated encoders, gearboxes, and whole family of fischertechnik sensors. ROBO Pro software, exclusive line of fischertechnik, offering 5 levels programming, from the beginner level to the Pro level programming involving objects, subroutines, variables, and user-defined commands. Various Competition Scopes and Outlines are also included.

> Incl. didactic material on CD

> Incl. **ROBOTICS TXT Controller, CD with ROBO Pro control software, 2x encoder motors, XS motor, 3x ultrasonic distance sensors, IR trail sensors, optical color sensor, photoresistor, phototransistor, NTC resistor, magnetic sensor (reed), rechargeable battery (Accu Set)**



Item No.	51 9143	EAN	4048962159356
Models	17	Components	565
Dim. (mm)	440 x 315 x 150	Weight (g)	3600

MINI BOTS

100


3
Models

From Electronics to Robotics

The new Mini Bots are the ideal introduction to the Education Line Robotics Sets by fischertechnik. Students can make three nimble mobile robots from more than 100 parts assisted by sensors (IR trail sensor, push buttons) and actuators, such as the XS motor. The easily understood robot models can follow lines and avoid hindrances. The Mini Bot programs are saved on the fischertechnik control, the electronics module, and can be adjusted with the DIP switches. The selection of set programs makes it easy to discover the world of Robotics.

Main subjects:
Electronic parts / controlling and regulating / use of actuators and sensors



> Incl. electronics module, IR trail sensor, 2x push buttons, 2x XS motors, battery holder for 9V block (battery not included)

Item No.	53 3923	EAN	4048962230000
Models	3	Components	100
Dim. (mm)	440 x 315 x 80	Weight (g)	1490



Main subjects:
Electrical circuits, series, parallel and three-way / four-way circuits / electronic components and circuits, etc.

ELECTRONICS

260


16
Models

Principles of Electronics

Simple circuits, series and parallel connections, electronic circuits with transistors, capacitors, resistors and LED's. Step by step, this educational construction set teaches the basic principles of electronics. The electronics module, a control with 16 fixed programs, has 2 motor outputs, 3 analog inputs for sensors and a potentiometer for controlling the speed of the motor. Many fascinating as well as functional models can be built with this construction set, from a simple flashlight to a ship see-saw, alternating flasher and controllable ventilating fan.

> Incl. instructional activity booklet
> Incl. electronics module, XS motor, 2x transistors, 2x capacitors, 3x resistors, 2x mini-switches, phototransistor, temperature sensor, lens tip lamp, 2x LED's, battery tray for 9V block (battery not included)

Item No.	53 3029	EAN	4048962220797
Models	16	Components	260
Dim. (mm)	440 x 315 x 80	Weight (g)	2191

▶ SIMPLE MACHINES

500


40
Models

Introduction to everyday engineering!

40 models, including vehicles with steering, bulldozer with tracks, crane with cable winch, windmill with reduction gear, allow school children a fascinating glimpse into the world of technology while playing. The large number of parts (gears, structural parts, building blocks, building boards, etc.) leaves maximum leeway for creativity. A MUST for all class rooms.

> **Ideal supplements: Motor Set XS, Motor Set XM, Power Set**

Main subjects:

Transmissions / block and tackle / steering / centrifugal governor / cable winch / structural engineering

Item No.	53 3506	EAN	4048962223361
Models	40	Components	500
Dim. (mm)	440 x 315 x 150	Weight (g)	2832

(US version: Introduction to STEM I - Item No.: 53 3353)



▶ MECHANICS

500


30
Models

Principles of Mechanical and Structural Engineering

This educational construction set is ideal for future machine builders, technicians and engineers: How does a manual transmission work? What is a planetary gear set or a differential? How is the movement of a windshield wiper controlled? How do you design a stable bridge?

This educational construction set answers these and other elementary questions from the subject areas of mechanical and structural engineering using 30 different models.

> **Incl. instructional activity booklet**
> **Incl. mini motor, battery tray for 9V block (battery not included)**

Main subjects:

Mechanical / structural engineering / effect of forces on bodies and objects, and much more

Item No.	533021	EAN	4048962220766
Models	30	Components	500
Dim. (mm)	440 x 315 x 150	Weight (g)	3155





► PNEUMATICS

440


8
Models

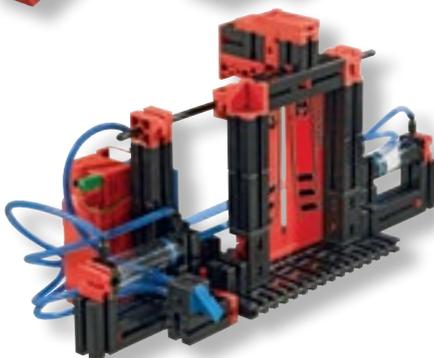
Fundamentals of Pneumatics

This play-and-learn construction set familiarizes children with the principles of pneumatics using realistic models to demonstrate how compressors, pneumatic valves and cylinders work. The powerful and compact compressor guarantees a reliable supply of compressed air for the models. A total of eight educational models can be built to provide future technicians and engineers with comprehensive background knowledge on the subject of pneumatics in combination with the instructional activity booklet.

Main subjects:

Generation and distribution of compressed air and control of pneumatic cylinders, and much more

- > **Ideal supplement: Accu Set**
- > **Incl. instructional activity booklet**
- > **Incl. compressor, 4x pneumatic cylinders, 4x 4/3-way manual valves, battery tray for 9V block (battery not included)**



Item No.	53 3013	EAN	4048962220711
Models	8	Components	440
Dim. (mm)	440 x 315 x 150	Weight (g)	2991

▶ OPTICS & LIGHTS

270


15
Models

Principles of Optics and Light

Investigate optical phenomena and experiment with light! The planetary model clearly demonstrates why the moon has phases or why solar and lunar eclipses occur. Optical lenses with various focal lengths, mirrors, lens tip lamps and a variety of other parts allow construction of a microscope, magnifier, telescope and periscope. Time can be measured with a sun dial. This model uses fiber-optic cable to demonstrate what total reflection is and how data can be transferred using light. This educational construction set gives school children a glimpse into the world of optics and light.

- > **Ideal supplement: Power Set or Accu Set**
- > **Incl. instructional activity booklet**
- > **Incl. 3x optical lenses (two focal lengths), rainbow LED, mirror, fiber-optic cable, 2x lens tip lamps**

Main subjects:
Refraction / reflection of light / light and shadow / fiber-optic cable / optical illusions, and much more



Item No.	53 3037	EAN	4048962220803
Models	15	Components	270
Dim. (mm)	440 x 315 x 80	Weight (g)	2262

▶ DRIVE SYSTEMS

280


8
Models

Principles of Drive Technology

How does a recoil or bending rod drive work?

What is the difference between a friction drive and a rubber band drive?

How can wind be used for propulsion?

This set provides a glimpse into how different types of drives work.

The instructional activity booklet provides a great deal of interesting information.

Main subjects:
Wind propulsion / bending rod drive / recoil drive / rubber band and friction motors

- > **Incl. instructional activity booklet**
- > **Incl. friction motor**

Item No.	53 3028	EAN	4048962220780
Models	8	Components	280
Dim. (mm)	440 x 315 x 80	Weight (g)	1045





GREEN ENERGY

390

19
Models

Principles of Regenerative Power

How can ecological electric power be produced? How does a fuel cell work and how does it generate hydrogen? "Renewable energy sources" will become our most important suppliers of energy in the future. Production, storage and use of electricity from natural energy sources such as water, wind and sun are graphically illustrated using various models and numerous experiments. The high performance solar modules open up many attachment possibilities for flexible use in models.

The Gold Cap included for power storage releases the stored power slowly. The fuel cell clearly demonstrates how water can be split up into its two constituents: Hydrogen and oxygen. This helps children understand energy forms of the future. The instructional activity booklet offers assistance.

Main subjects:

Generation, storage and use of electrical power from water, wind and sun / other energy sources:
Fuel cell

- > Incl. instructional activity booklet
- > Incl. solar motor (2V \pm), 3x solar modules (1V; 400 mA), Gold Cap power storage device, LED, ON / OFF switch
- > Incl. reversible fuel cell with integrated hydrogen storage tank

Item No.	53 3022	EAN	4048962220773
Models	19	Components	390
Dim. (mm)	440 x 315 x 150	Weight (g)	3278

PHYSICS I

Introduction into Physics

Physics is fun. Balls race on unique flex-rails through various obstacle courses. They accelerate, decelerate, cause chain reactions, shoot through the loop and run through obstacles such as teeter-totters and switches. An elevator powered by an XS motor conveys the balls to the top. The effects are based on various physical phenomena (acceleration, inertia of mass, centrifugal force, law of conservation of energy, principle of linear momentum, laws of motion). These are explained in the instructional activity booklet and can be demonstrated clearly using various experimental set-ups.

- > Incl. instructional activity booklet
- > Incl. XS motor, 22x flex-rails, 10x balls, 3x magnetic holders, battery tray for 9V block (battery not included)

690


7
Models

Main subjects:

Centrifugal force / force of gravity / acceleration / law of conservation of energy / pulses



Item No.	53 3050	EAN	4048962220810
Models	7	Components	690
Dim. (mm)	440 x 315 x 150	Weight (g)	3589

PHYSICS II

Principles of Elevator and Conveying Technology

With special parts such as 90° turns, cross-over and jumps with catch funnel, balls race through tight curves and chutes and fly through various tracks. Discover exciting conveying technology: With the wheel and stage conveyor models the balls are moved up by a motor-driven conveying wheel. Then even higher by the innovative stage conveyor, which transports the balls one by one all the way to the top in a zig-zag pattern. Once there the balls shoot along their own path downward through the loop, quarter pipe and jumping loop. More ingenious models such as a launching pad, stair step conveyor and chain lift make the subject of conveying technology inspiring.

1250


8
Models

Main subjects:

Elevator technology / conveying technology

- > Incl. instructional activity booklet
- > Incl. mini motor, 2x rainbow LED's, 31x flex-rails, 12x balls, 3x magnetic holders, 5x 90° turns, cross-over, catch funnel, battery tray for 9V block (battery not included)

Item No.	53 3053	EAN	4048962220827
Models	8	Components	1250
Dim. (mm)	440 x 315 x 150	Weight (g)	4733





**› STEM ENERGY,
POWER & ROBOTICS**

Project-Based Learning – Focused on Standards
 “The fischertechnik STEM program meets Common Core Standards for Math, Reading and Writing as well as the National Science Education Standards, and standards of ISTE, ITEEA. This program can easily fill some months of class time and engage students in the study of Applied Physics with a systems approach to Electronics, Control and Sensing.”

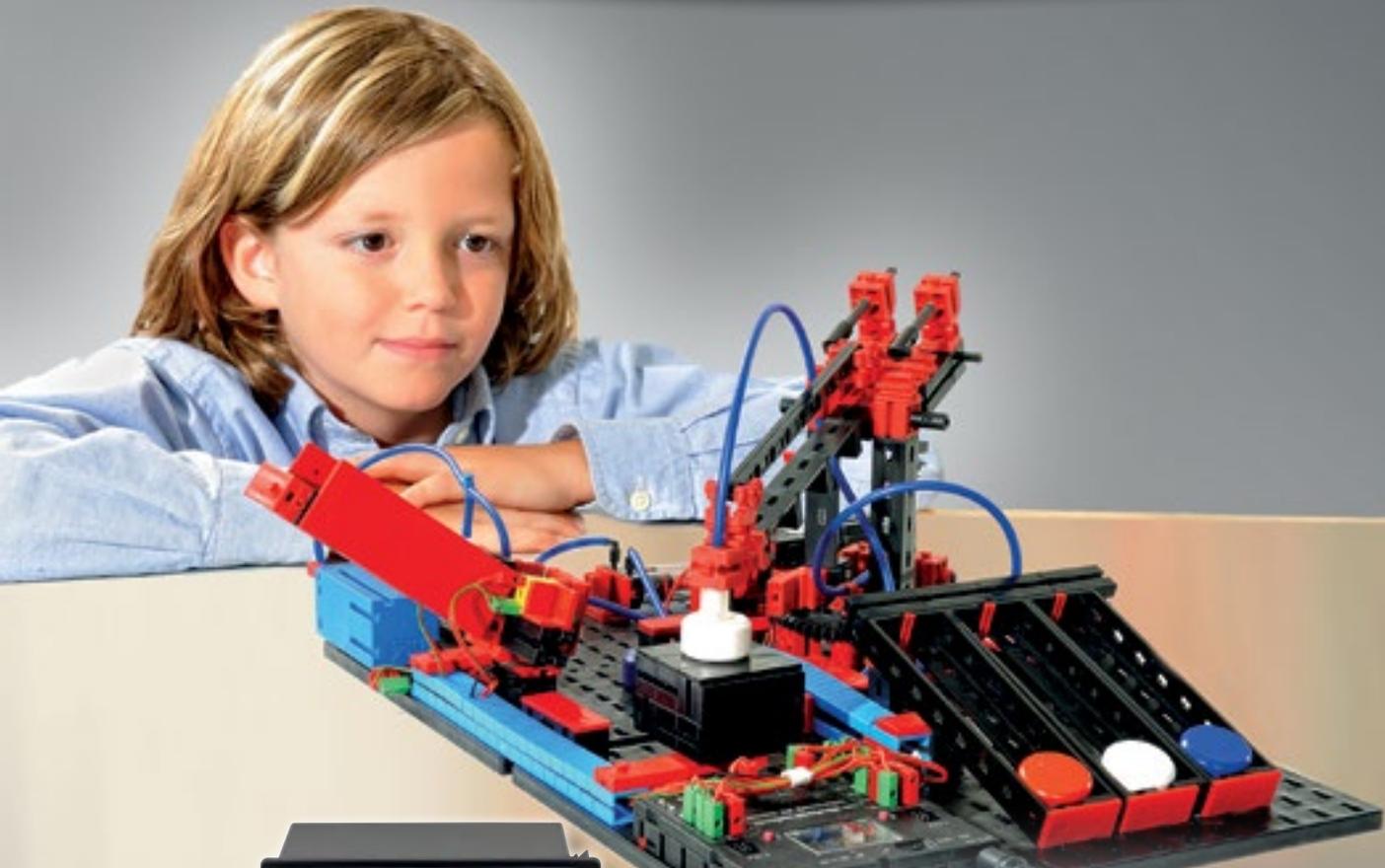
Tom White, Program Creator

Main subjects:
 Energy / Power / Robotics

Project Themes:
 Sketching and Documentation / Introduction to Energy and Power / Energy Conversion Systems / Conversion and Storage of Energy / Simple Machines / Mechanisms / Basic Electricity / Introduction to Control Systems / Human & Machine Collaboration / Introduction to Sensors / Robotics

- > Incl. CD with ROBO Pro control software and extensive STEM tutorials
- > Incl. fischertechnik Controller and Accu Set (charger with rechargeable NiMH battery)
- > Incl. most of the fischertechnik sensors and actuators and lots of fischertechnik building components to build lots of STEM KIT models

Item No.	51 9340	EAN	4048962160864
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► STEM ENGINEERING

Project-Based Learning – Focused on Standards

“The fischertechnik STEM program meets Common Core Standards for Math, Reading and Writing as well as the National Science Education Standards, and standards of ISTE, ITEEA. This program can easily fill some months of class time and engage students in the study of Applied Physics with a systems approach to Electronics, Control and Sensing.”

Tom White, Program Creator

Main subjects:
Mechatronics

Project Themes:

Sketching and Documentation / Structures / Mechanical Systems / Control Systems / Sensor Systems / Motors and other Actuators / Automation / Fundamentals of Robotics / Mobile Robotics / Robotics Competition

- > Incl. CD with ROBO Pro control software and extensive STEM tutorials
- > Incl. fischertechnik Controller and Accu Set (charger with rechargeable NiMH battery)
- > Incl. most of the fischertechnik sensors and actuators and lots of fischertechnik building components to build lots of STEM KIT models



Item No.	51 9341	EAN	4048962160871
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Main subjects:
Pre-assembled industrial type
of simulation models
in 9V and 24V for Vocational
Training and Higher
Education to learn all about
Automation Control

➤ **PUNCHING MACHINE
WITH CONVEYOR BELT**

Conveyor belt with two light barriers, one machining station and one workpiece.

- > Model is mounted on stable wooden board, carton packaging
- > Model can be ideally combined with 3-D Robot
- > Incl. 2x DC motors, 2x limit switches (potential free), 2x light barriers consisting of phototransistor and lens tip bulb
- > Incl. Ribbon cable, 14-pin and color coded with 14-pin pin connector, only for 24V $\ddot{=}$.
- > 4 digital inputs, 4 outputs, 9V $\ddot{=}$ / 24V $\ddot{=}$. (2 motors counter-clockwise, clockwise rotation)

Item No. 51 663 (training model punching machine 9V $\ddot{=}$ with ROBOTICS TXT Controller)

Item No. 96 785 (training model punching machine 24V $\ddot{=}$ without PLC)

Item No.	51 663 (9 V $\ddot{=}$)	EAN	4006209516638
Item No.	96 785 (24 V $\ddot{=}$)	EAN	4006209967850
Dim. (mm)	375 x 290 x 190	Weight (g)	1900 (9 V $\ddot{=}$), 1500 (24 V $\ddot{=}$)



Port: PCB with relays to reverse polarity of motor, multi pin connector (26 pins, grid 2,54mm) and in addition PCB terminals with push in connection for all I/O



➤ **3-D-ROBOT**

3-axis robot with gripping device.
Degrees of freedom:
Shaft 1: Rotation 180°
Shaft 2: Forward / back 90 mm
Shaft 3: Up / down 150 mm

- > Model mounted on stable wooden board, carton packaging
- > Model can be ideally combined with conveyor belt, punch press and intermittent assembly line
- > Incl. 4x DC motors, including 2 with integrated magnetic encoder (max. pulse frequency: 1 kHz), 4x limit switches, 2x pulse sensors for path measurement
- > 8 digital inputs, 8 outputs, 9V $\ddot{=}$ / 24V $\ddot{=}$. (4 motors clockwise / counterclockwise rotation, 24V $\ddot{=}$ version includes relay board for motor polarity reversal)

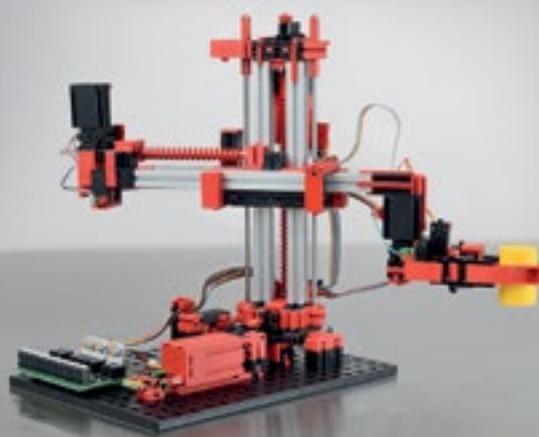
Item No. 511 937 (training model 3-D-Robot 9V $\ddot{=}$ with ROBOTICS TXT Controller)

Item No. 511 938 (training model 3-D-Robot 24V $\ddot{=}$ without PLC)

Item No.	51 1937 (9 V $\ddot{=}$)	EAN	4048962111705
Item No.	511 938 (24 V $\ddot{=}$)	EAN	4048962111316
Dim. (mm)	480 x 400 x 220	Weight (g)	3200 (9 V $\ddot{=}$), 2900 (24 V $\ddot{=}$)



Port: PCB with relays to reverse polarity of motor, multi pin connector (26 pins, grid 2,54mm) and in addition PCB terminals with push in connection for all I/O



INDEXED LINE WITH TWO MACHINING STATIONS

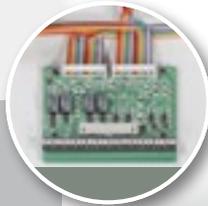
Conveyor belt, arranged in U-shape, for intermittent transport and for the machining of several workpieces.

- > Model is mounted on a stable wooden board, carton packaging
- > Incl. 2x machining stations, 4x conveyor belts, 8x DC motors, 4x limit switches (potential free), 5x light barriers consisting of phototransistor and lens tip bulb
- > 9 digital inputs, 10 outputs, 9V $\ddot{=}$ / 24V $\ddot{=}$. (6 motors with one direction of rotation, 2 motors counterclockwise, clockwise rotation)

Item No. 51 664 (training model indexed line 9V $\ddot{=}$ with ROBOTICS TXT Controller)

Item No. 96 790 (training model indexed line 24V $\ddot{=}$ without PLC)

Item No.	51 664 (9 V $\ddot{=}$)	EAN	4006209516645
Item No.	96 790 (24 V $\ddot{=}$)	EAN	4006209967904
Dim. (mm)	475 x 450 x 270	Weight (g)	5700 (9 V $\ddot{=}$), 5100 (24 V $\ddot{=}$)



Port: PCB with relays to reverse polarity of motor, multi pin connector (26 pins, grid 2,54mm) and in addition PCB terminals with push in connection for all I/O

CONVEYOR BELT

Length 275 mm, transports workpieces with a diameter of up to 29 mm. Several conveyor belts can be connected to each other to form a conveyor belt of any length.

- > Model is mounted on stable wooden board, carton packaging
- > Incl. DC motor, sensing device (potential-free), choice as pulse counter, can be used for distance travelled or as an activation button; 2x light barriers consisting of phototransistor and lens tip bulb, which can be connected together to an output for the control or directly to the power supply
- > Incl. workpiece diameter 29 mm, h=25 mm
- > 3 digital inputs, 1 output 9V $\ddot{=}$ / 24V $\ddot{=}$. (1 motor for drive for conveyor belt)

Item No. 50 463 (training model conveyor belt 9V $\ddot{=}$ with ROBOTICS TXT Controller)

Item No. 50 464 (training model conveyor belt 24V $\ddot{=}$ without PLC)

Item No.	50 463 (9 V $\ddot{=}$)	EAN	4006209504635
Item No.	50 464 (24 V $\ddot{=}$)	EAN	4006209504642
Dim. (mm)	345 x 240 x 100	Weight (g)	1500 (9 V $\ddot{=}$), 1200 (24 V $\ddot{=}$)



Port: PCB with relays to reverse polarity of motor, multi pin connector (26 pins, grid 2,54 mm) and in addition PCB terminals with pushin connection for all I/O



PNEUMATIC PROCESSING CENTER

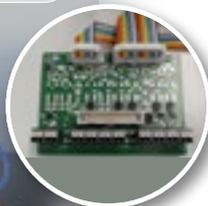
Machining center with bin for workpieces, turntable, machining station, compressor and conveyor belt for the transport of workpieces.

- > Model is mounted on a stable wooden board, carton packaging
- > Incl. double-action and two single-action pneumatic cylinders, 4x 3/2 way magnetic valves, DC motor, 4x switches (potential free), 2x light barriers consisting of phototransistor and lens tip bulb
- > 6 digital inputs, 6 outputs, 9V $\ddot{=}$ / 24V $\ddot{=}$.

Item No. 524 064 (training model pneumatic center 9V $\ddot{=}$ with ROBOTICS TXT Controller)

Item No. 520 529 (training model pneumatic center 24V $\ddot{=}$ without PLC)

Item No.	524 064 (9 V $\ddot{=}$)	EAN	4048962193909
Item No.	520 529 (24 V $\ddot{=}$)	EAN	4048962169119
Dim. (mm)	475 x 450 x 270	Weight (g)	5700 (9 V $\ddot{=}$), 4100 (24 V $\ddot{=}$)



Port: PCB with relays to reverse polarity of motor, multi pin connector (26 pins, grid 2,54mm) and in addition PCB terminals with push in connection for all I/O



➤ **CREATIVE BOX 1000**

Supplement for all fischertechnik sets!
More than 700 components from the current fischertechnik assortment (no electronic parts). Packed in BOX 1000 with building board, 390 x 270 mm as cover.

Item No.	91 082	EAN	4006209910825
Components	720	Weight (g)	2750
Dim. (mm)	390 x 95 x 270		



➤ **BOX 500**

Perfect for storing fischertechnik parts
Practical storage box for fischertechnik parts. Size: 258 x 186 x 40 mm

Item No.	94 828	EAN	4006209948286
Components	–	Weight (g)	158
Dim. (mm)	258 x 186 x 40		

+ Base plate: 32985, EAN: 4006209329856



➤ **BOX 1000**

Perfect for storing fischertechnik parts
Practical storage box with eight sorting trays and 32 sorting partitions. The cover also serves as a large building board, 390 x 270 mm.

Item No.	30 383	EAN	4006209303832
Components	–	Weight (g)	1860
Dim. (mm)	390 x 95 x 270		



➤ **ACCU SET**

Charger with micro-controller for reliable protection against overcharging. Extremely short charging times, max. 2 hrs., heavy duty battery pack with short-circuit protection, 8.4V / 1500 mAh.



Item No. 220V	34 969	EAN	4006209349694
Item No. 120V	57 487	EAN	4006209574874
Item No. 240V	UK 79 833	EAN	4006209798331
Item No. 240V	AUS 52 091	EAN	4006209520918
Components	–	Weight (g)	490
Dim. (mm)	225 x 65 x 150		



➤ **POWER SET**

Power supply and infinite speed controller all in one. The plug-in power pack for all fischertechnik models. Power supply performance data: Voltage 9V..., 2.5 A. Power controller performance data: Controllable output 1A max., additional output with 9V..., 1A max. (not controllable), both outputs short-circuit-proof with overload protection.

Item No. 220V	505 283	EAN	4048962069440
Item No. 120V	91 087	EAN	4006209910870
Components	–	Weight (g)	430
Dim. (mm)	225 x 65 x 150		



➤ **CONTROL SET**

Four channel infrared remote control allows remote control of fischertechnik models. Proportional control of up to three motors and one servo-unit allowing infinitely variable steering wheel turning angle and infinitely variable speed control. Remote control can be operated with up to four receivers allowing numerous applications.

Item No.	500 881	EAN	4048962003277
Components	–	Weight (g)	370
Dim. (mm)	225 x 65 x 150		

> **Required: Accu Set**

➤ **fischertechnik in BMA Schools Thailand**



➤ **fischertechnik in Vocational Schools Germany**



➤ **fischertechnik Learning Center Taiwan**

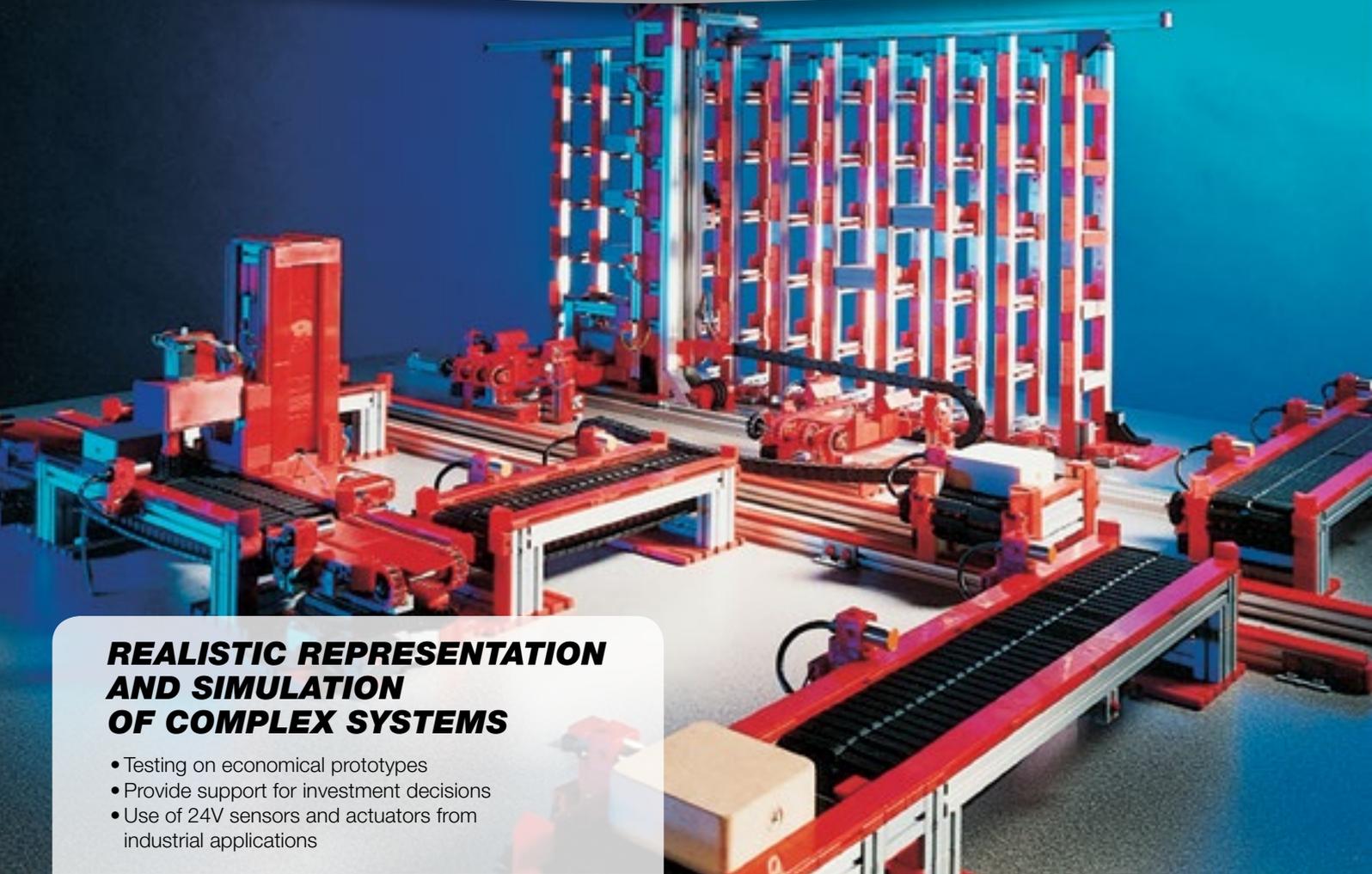


➤ **fischertechnik team Croatia at RoboCup Worldcup**



➤ **fischertechnik University Competition China**





**REALISTIC REPRESENTATION
AND SIMULATION
OF COMPLEX SYSTEMS**

- Testing on economical prototypes
- Provide support for investment decisions
- Use of 24V sensors and actuators from industrial applications



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