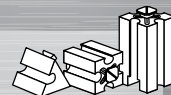


ENGLISH

Building Blocks For Life



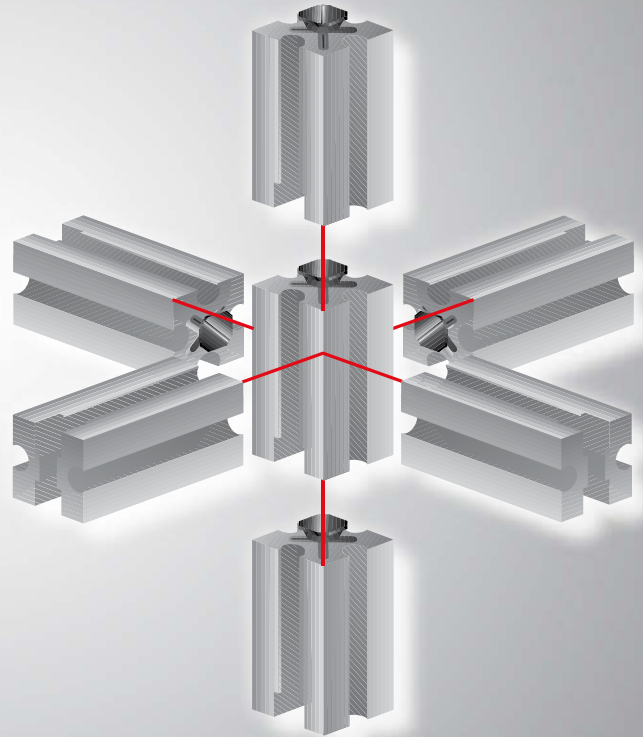
What is fischertechnik?

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 Education (Science, Technology, Engineering and Mathematics). 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 Maths 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



STEM KITS

Various Science and Technology Kits

Page 6–10



STEM ROBOTICS

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

Page 11–15



STEM S

Project based STEM SETS, aligned with the

Page 16–17





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

The fischertechnik learning products are used extensively around the globe, to explore STEM concepts such as:

- **Simple Machines**
- **Mechanics**
- **Statics**
- **Pneumatics**
- **Renewable Energies**
- **Solar Power**
- **Fuel Cell**
- **Optics & Lights**
- **Electronics**
- **Physics**
- **Robotics**
- **Cybernetics**
- **Mechatronics**
- **Automation Control**

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

ETS

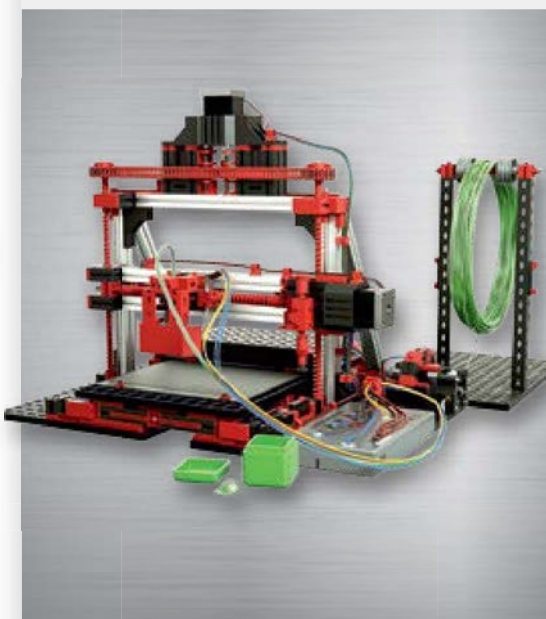
STEM curriculum



3D PRINTER

Fascinating insight into the groundbreaking technology of 3D printing

Page 18



TRAINING MODELS

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

Page 19-21



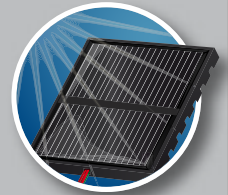
► TEACHING MATERIAL

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. Go to www.fischertechnik-elearning.com to find lots of instructional information, animations, tutorials and videos on the individual educational construction sets.



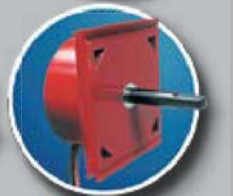
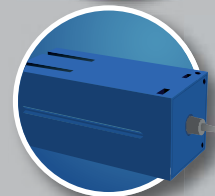
► "GREEN" COMPONENTS

- Gold Cap (3.0V / 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 / 5995rpm / 1.52mNm / 265mA)
 - S Motor (9VDC / 9500rpm / 4.8mNm / 650mA)
 - S Motor (24VDC / 10700rpm / 5mNm / 300mA)
 - XM Motor (9VDC / 338 rpm / 84.15mNm / 950mA)
 - Encoder motor (9VDC / 173.5rpm / 60.29mNm / 465mA)
 - Encoder motor (24VDC / 440rpm / 176.5mNm / 600mA)
 - Solar motor (2VDC)
- Compressor (9VDC / 0.7bar / 2l/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)



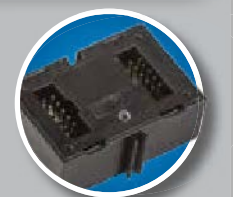
COMPATIBLE TO:

- Arduino
- BBC micro: bit
- Raspberry Pi

More information:
www.fischertechnik.de/third-party-compatibility

► SENSORS

- USB color camera (1MP) – recognition of color, motion, trail, sound 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
- Push button (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
- Combi sensor – 3 sensors in one device: triaxial 16bit gyroscope, triaxial 12bit accelerometer, geomagnetic sensor, I2C-port (9VDC)



➤ **ELECTRONICS MODULE
ROBOTICS MODULE**

- Electronic control for models with fixed programs
- DIP-switches to select programs
- 3 analog inputs
- 2 motor outputs
- Potentiometer



➤ **BEGINNER LEVEL**

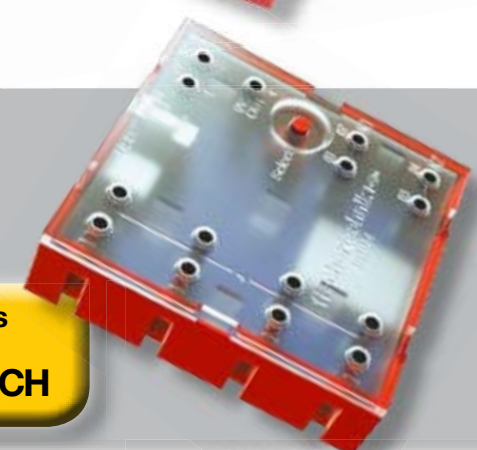
BT Smart Controller

- Processor – 32-bit Cortex M0
- Control unit connecting the model to a PC/tablet
- 2 motor outputs
- 4 digital inputs for sensors
- USB port and Bluetooth 4.0 port

Software ROBO Pro Light

- Simple and easy-to-understand graphic programming (“drag & drop”)

Works with:
SCRATCH



➤ **ADVANCED LEVEL**

TXT Controller

- Dual Processor – 32bit / 600MHz
- 128MB RAM, 64MB 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 0–5kΩ
- 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



**TOUCH
DISPLAY**



**Android
iOS
APP**



WiFi



**USB
Host**



Speaker



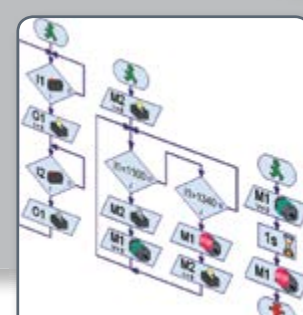
**CARD
Slot**



Bluetooth®



Works with:
SCRATCH



➤ **SIMPLE MACHINES**

500


40
Models

Introduction to everyday engineering!

40 models, including vehicles with steering, bulldozer with tracks, crane with cable winch and windmill with reduction gear, allows students 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 additions: Motor Set XS, Motor Set XM, Power Set**

Main subjects:

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

Item No.	533506	EAN	4048962223361
Models	40	Components	500
Dim. (mm)	440 x 315 x 150	Weight (g)	2832



➤ **MECHANICS 2.0**

500


30
Models

Principles of Mechanical and Structural Engineering

This educational building set is ideal for future mechanical engineers, technicians and engineers: How does a shaft drive or a gearbox work? What is a planetary gear? How do you build a stable bridge? This educational building set containing 30 different models helps you to answer these and other fundamental questions from the world of mechanics and structural engineering. The eLearning portal (fischertechnik-elearning.com) features interesting, educational information and videos about mechanics and structural engineering.

- > **Incl. instructional activity information (free download)**
- > **Incl. XS motor, battery tray for 9V block (battery not included)**
- > **Ideal addition: Accu Set**

Main subjects:

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

Item No.	538423	EAN	4048962263350
Models	30	Components	500
Dim. (mm)	440 x 315 x 150	Weight (g)	2910



> PNEUMATICS: BEGINNER

200


5
Models


Fundamentals of Pneumatics

The Pneumatics: Beginner construction set takes a learning-by-playing approach to the principles of pneumatics, with realistic models to show how pneumatic valves and cylinders work. The air is pumped manually into an air chamber. Pressing the hand valves conveys the compressed air through the hoses into the pneumatic cylinder. An excavator and four other models can be constructed. The didactic activity information for pneumatics is available online (fischertechnik-elearning.com) for the young engineers.

- > Incl. instructional activity information (free download)
- > Incl. 2x pneumatic cylinders, pump cylinder, 2x hand valves, compressed air reservoir

Item No.	540946	EAN	4048962281811
Models	5	Components	200
Dim. (mm)	440 x 315 x 80	Weight (g)	1500



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



> PNEUMATICS

440


8
Models


Fundamentals of Pneumatics

This play-and-learn construction set familiarizes students 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 information.

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

Item No.	533013	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.

> Incl. instructional activity booklet

> Incl. 3x optical lenses (two focal lengths), rainbow LED, mirror, fiber-optic cable, 2x lens tip lamps, battery tray for 9V block (battery not included)

> Ideal addition: Power Set or Accu Set

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

Item No.	533037	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.	533028	EAN	4048962220780
Models	8	Components	280
Dim. (mm)	440 x 315 x 80	Weight (g)	1045



► **SOLAR: BEGINNER**

160


4


Principles of Solar Power

Renewable energy sources will play an increasingly significant role in future. A solar module generates electricity from the energy of the sun to move the solar boats and the solar car. Whether on water or land, the construction set is a learning-by-playing approach to solar power. The solar module and solar motor can be used to make a solar vehicle, a ventilating fan and two floating ship models („Solar Catamaran“ and „Paddle Steamer“). The didactic activity information about solar is available online (fischertechnik-eLearning.com).

> Incl. instructional activity information (free download)

> Incl. solar module (2V \dots ; 200mA), solar motor (2V \dots), boat hull

Item No.	540947	EAN	4048962281828
Models	4	Components	160
Dim. (mm)	440 x 315 x 80	Weight (g)	1500



Main subjects:

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



► **GREEN ENERGY**

390


19


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 students understand energy forms of the future. The instructional activity booklet offers assistance.

> Incl. instructional activity booklet

> Incl. solar motor (2V \dots), 3x solar modules (1V; 400mA), Gold Cap power storage device, LED, ON / OFF switch

> Incl. reversible fuel cell with integrated hydrogen storage tank

Item No.	533022	EAN	4048962220773
Models	19	Components	390
Dim. (mm)	440 x 315 x 150	Weight (g)	3278



PHYSICS I 2.0

780


7
Models

Introduction into Physics

Physics is fun! With a track length of up to 4.5 m, the three different action courses offer boundless marble ball run fun. The four educational experimental models also indirectly explain the effects of different physical phenomena (acceleration, inertia, balance of forces, principle of conservation of energy, principle of linear momentum, laws of motion). The eLearning portal (fischertechnik-elearning.com) features interesting, educational information and videos about physics.

- > Incl. instructional activity information (free download)
- > Incl. XS motor, 4x high-speed curves, 17x flex-rails 180, 8x flex-rails 90, 10x balls, 3x 180° curves, 4x 90° curves, cross-over, catch funnel, battery tray for 9V block (battery not included)
- > Ideal additions: Sound+Lights, LED Set, Accu Set or Power Set

Main subjects:

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



Item No.	538424	EAN	4048962263367
Models	7	Components	780
Dim. (mm)	440 x 315 x 150	Weight (g)	3334



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 ventilation fan.

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

Main subjects:

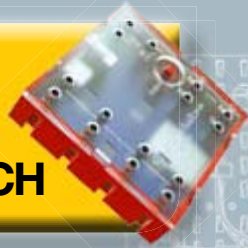
Electrical circuits, series, parallel and three-way / four-way circuits / electronic components and circuits, and much more



Item No.	533029	EAN	4048962220797
Models	16	Components	260
Dim. (mm)	440 x 315 x 80	Weight (g)	2191



Works
with:
SCRATCH



▶ ROBOTICS: BT BEGINNER

380
12
Models

Instrumentation and Control (I&C)

With over 380 pieces and the aid of sensors (phototransistors, push buttons) and actuators (XS motors, LED light barriers), students can construct 12 easy-to-understand models such as hand dryer, carousel, level crossing, conveyor belt with stamping machine and mobile caterpillar machine. The BT Smart Controller with 4 inputs for sensors and 2 outputs for motors and lamps features a USB port and a Bluetooth 4.0 port. The ROBO Pro Light software (available for download) makes it possible to program the models quickly, easily and in a way that is easy to follow. In addition, it is also possible to program the models using a tablet (initially Android) via an app. Comprehensive instructions are provided on the fischertechnik eLearning portal (fischertechnik-elearning.com) to support the student's learning process and to explain the programming in an easy-to-follow way. For the engineers and programmers of tomorrow.

- > Incl. instructional activity information (free download)
- > Incl. BT Smart Controller (USB port/ Bluetooth 4.0 port), control software ROBO Pro Light (System: Windows 7*, 8, 10/tablet: initially Android), 2x XS motors, 2x LED light barriers, 2x photo transistors, 2x push buttons, battery tray for 9V block (battery not included)

* Selected Bluetooth 4.0 sticks are required for Windows 7

Item No.	540587	EAN	4048962280067
Models	12	Components	380
Dim. (mm)	440 x 315 x 80	Weight (g)	2000

Main subjects:

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



ROBOTICS: MINI BOTS

145
5 Models

From Electronics to Robotics

The Mini Bots are the ideal introduction to the Education Line Robotics by fischertechnik. Five nimble mobile robots can be made from actuators and sensors, such as XS motors, IR trail sensor and push buttons. The clever robot models can follow lines and avoid hindrances. An obstacle course template can be used to test the models directly. The Mini Bot programs are saved on the fischertechnik ROBOTICS module and can be selected with the DIP switches. The selection of available programs makes it easy to discover the world of robotics.

- > Incl. instructional activity information (free download)
- > Incl. ROBOTICS module, IR trail sensor, 2x push buttons (limit switch), 2x XS motors, battery tray for 9V block (battery not included)

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

Item No.	533923	EAN	4048962230000
Models	5	Components	145
Dim. (mm)	440 x 315 x 80	Weight (g)	1505



Works with: SCRATCH

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.	93296	EAN	4006209932964
System	Windows® 7, 8, 10		
Dim. (mm)	210 x 25 x 150	Weight (g)	85

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: 128MB DDR3 RAM, 64MB Flash
- > 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.: 800mA): 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
- > 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 etc.
- > Link to smartphones / tablet PC's via Bluetooth or WLAN, allowing use as terminals for controller. Programming using ROBO-Pro software.
- > Power supply: 9VDC socket 3.45 mm or fischertechnik 2.5 mm sockets (for set of rechargeable batteries), Accu Set or Power Set

Item No.	522429	EAN	4048962179828
Dim. (mm)	225 x 65 x 150	Weight (g)	350

Vision System



Main subjects:

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



▶ 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 tracking and detection of motion. The TXT Controller has the following features: Dual processor ARM Cortex A8 (32bit / 600MHz) + 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, push buttons, 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.

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

Item No.	533018	EAN	4048962220735
Models	14	Components	310
Dim. (mm)	440 x 315 x 150	Weight (g)	3050




▶ ROBOTICS & ELECTRO-PNEUMATICS

440  4 

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.

- > Incl. instructional activity information (free download)
- > Incl. compressor, mini motor, 2x solenoid valves, optical color sensor, vacuum suction device, 3x cylinders with spring, 2x phototransistors, 2x lens tip lamps, 11x flex-rails 180
-  > Required: ROBOTICS TXT Controller, ROBO Pro software and 9V / 1A power pack (Accu Set or Power Set)

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

Item No.	533019	EAN	4048962220742
Models	4	Components	440
Dim. (mm)	440 x 315 x 150	Weight (g)	3162




▶ ROBOTICS IN INDUSTRY

510  4 

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 profiles used in all models. The didactic material 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

- > Incl. instructional activity information (free download)
- > Incl. 2x encoder motors, 2x XS motors, 6x push buttons
-  > Required: ROBOTICS TXT Controller, ROBO Pro software and 9V / 1A power pack (Accu Set or Power Set)

Item No.	533020	EAN	4048962220759
Models	4	Components	510
Dim. (mm)	440 x 315 x 150	Weight (g)	3328





▶ ROBOTICS COMPETITION SET

670  20  Models

Focus on robotics competitions

The fischertechnik Robotics Competition Set has been developed for schools, universities and other education establishments seeking to enhance or improve their previous robotics competitions for their students. It contains robot models such as the trail searcher, detection robot, soccer robot, hindrance detector with camera and much more. The models are suitable for the RoboCup competition (junior category) and various other competitions all over the world. The fischertechnik Robotics Competition Set helps students with project-based learning for discovering robotics and the key STEM teaching principles. The set consists of 670 parts. These include static parts, gear-wheels, transmissions, wheels, DC motors, motors with integrated encoders, USB camera, combi sensor (gyro, accelerometer, compass) and other fischertechnik sensors. Incl. ROBO Pro software with possibilities for programming on five levels. From the beginner's level through to professional programming with objects, sub-programs, variables and user-defined commands. Furthermore, obstacle course templates are included for testing the models.

Main subjects:
Robotics competitions

- > Incl. printed assembly instructions and instructional activity information on CD
- > Incl. ROBOTICS TXT Controller, CD with controller software ROBO Pro, USB camera, 2x encoder motors, XS motor, lens tip lamp, 3x LED's, combi sensor (gyro, accelerometer, compass), 3x ultrasonic distance sensors, IR trail sensor, optical color sensor, photo resistor, phototransistor, NTC resistor, magnetic sensor (reed contact), Accu Set (battery charger with rechargeable NiMH battery)

Item No.	519143	EAN	4048962159356
Models	20	Components	670
Dim. (mm)	440 x 315 x 150	Weight (g)	3760



P

R

E

P



STEM PREP **PHYSICS, ROBOTICS, ENERGY & POWER**

STEM Tutorial

2110

118 Models

Project-based learning with a focus on standards

“The fischertechnik STEM program combines maths, reading and writing standards in the compulsory subjects with the National Science Education Standards and the Standards of ISTE and ITEEA. The STEM PREP Set easily fills several months of the school year and introduces the students to applied technology through a systematic approach to physics, robotics, energy and power.”

Tom White, Program Creator

Main subjects:
Physics / Robotics / Energy / Power

Project Themes:

Simple machines / mechanical systems / structures / forces / pneumatics / potential and kinetic energy / energy preservation / energy conversion and storage / electricity / electronics / optics / digital communication and control programming

> Incl. assembly instructions for 118 model examples from 9 STEM Kits and comprehensive STEM tutorials for teachers and students on CD

> Incl. ROBOTICS LT Controller, CD with controller software ROBO Pro Light, electronics module, XS motor, mini motor, solar motor, pull-back motor, compressor, 2x solar modules, „Gold Cap“ energy storage device, LED, 2x rainbow LED's, phototransistor, NTC resistor, 2x push buttons

Item No.	519340	EAN	4048962160864
Models	118	Components	2110
Dim. (mm)	440 x 315 x 230	Weight (g)	6577



Main subjects:
Robotics / cybernetics /
mechatronics /
automation control

► STEM ENGINEERING

STEM Tutorial **890** **22 Models**

Project-based learning with a focus on standards

"The fischertechnik STEM program combines maths, reading and writing standards in the compulsory subjects with the National Science Education Standards and the Standards of ISTE and ITEEA. The STEM Engineering Set easily fills several months of the school year and introduces the students to applied engineering through a systematic approach to robotics, mechatronics and automation control."

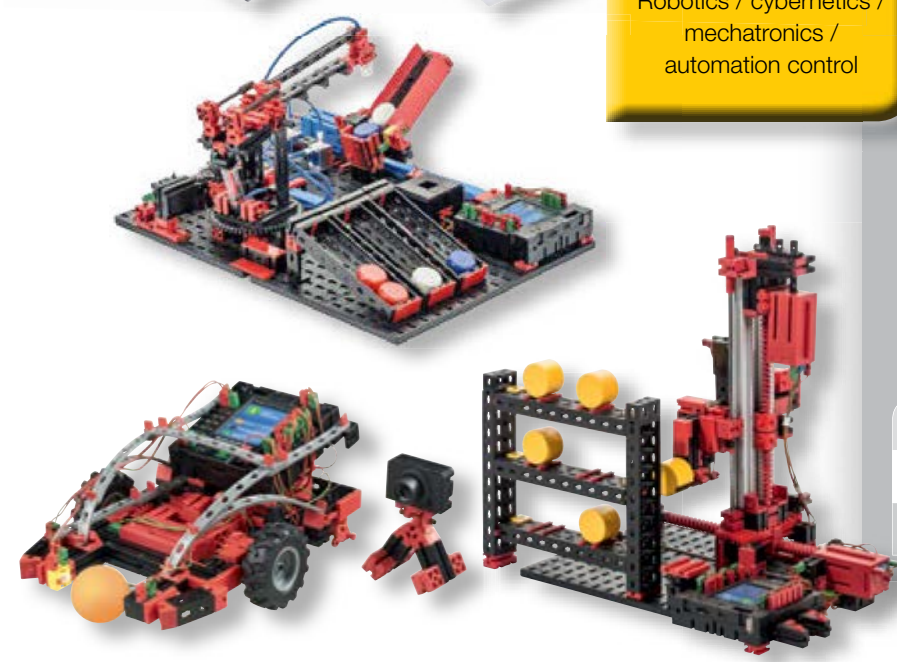
Tom White, Program Creator

Project Themes:

Mechatronics / cybernetics / design and documentation / structures / mechanical systems / control systems / sensor systems / motors and other actuators / automation / principles of robotics / mobile robots

- > Incl. assembly instructions for 22 model examples from 3 STEM Robotics Kits and comprehensive STEM tutorials for teachers and students on CD
- > Incl. ROBOTICS TXT Controller, CD with controller software ROBO Pro, USB camera, 2x encoder motors, 2x XS motors, mini motor, compressor, 2x LEDs, 2x solenoid valves, vacuum suction device, optical color sensor, 2x phototransistors, NTC resistor, 6x push buttons (limit switch), Accu Set (battery charger with rechargeable NiMH battery)

Item No.	519341	EAN	4048962160871
Models	22	Components	890
Dim. (mm)	440 x 315 x 150	Weight (g)	5450



› 3D PRINTER

Powered by: German RepRap 

890


Build, Plug & Print! This build-it-yourself kit gives users a fascinating insight into the groundbreaking technology of 3D printing. Print your own parts yourself at any time - so individual, so easy, so flexible - for use! Use either the supplied printing examples, different examples on our eLearning portal (fischertechnik-elearning.com) or your very own print data. The robust 3D Printer is easy to build and can be used for 3D printing of different parts. Users acquire basic knowledge about 3D printing and an insight into this revolutionary technology that promises a high degree of future potential. Includes PC software for controlling the printer via the USB interface. The eLearning portal offers exciting, instructional activity information and videos.

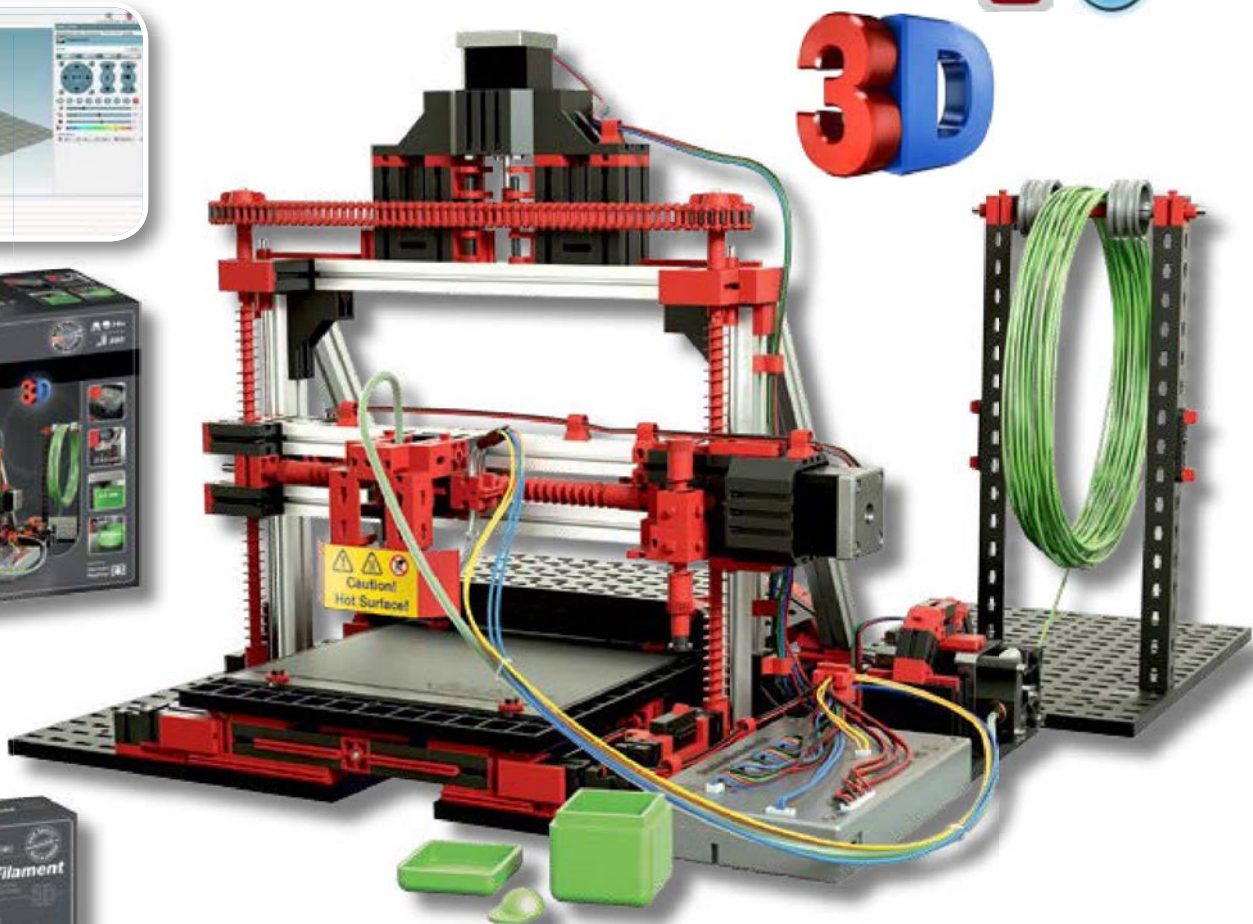
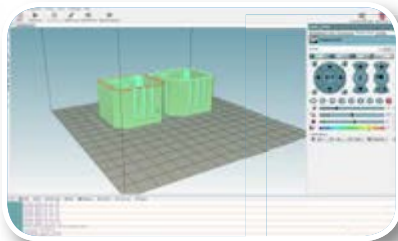
- > Incl. 3D Controller with Atmel microcontroller, USB interface for PC (Micro B USB port, incl. interface cable), 4 step motor drivers (for x-, y- and z-axes and extruder), one power output (MOS-FET) for the extruder nozzle (hot end), connections for 3 limit switches and a temperature sensor, DC port for voltage supply 19V, 6.3A. Dimension: 150x90x25 mm
- > Incl. 3D Print Control software, with slicer and printer control, specially adapted to fischertechnik 3D Printers (Windows 7, 8, 10). Numerous finished printing examples included as G-codes and STL files. Also works with Mac OS X and Linux with the software RepetierHost: www.fischertechnik.de/3DPrinter-FAQ
- > Incl. 4 high-torque step motors (x-, y- and z-axes, extruder), 3 mini push buttons (as limit switches for x-, y- and z-axes), heated nozzle (for 1.75 mm diameter filament) with temperature monitoring, printing bed with removable printing plate
- > Incl. power unit (AC input 100-240V, DC output 19V, 6.3A, 50-60Hz)
- > Incl. high quality filament (50 g roll, PLA, 1.75 mm diameter, green). Premium filament in special fischertechnik colors (50 g roll or 500 g coil) can be ordered separately
- > Incl. instructional activity information (free download)

Main subjects:
Basic knowledge of 3D printing / interaction between hardware and software / robotics / control

Technical data:

- Printing range: 115x100x65 mm
- Layer thickness: min. 0.2 mm
- Filament diameter: 1.75 mm
- Nozzle diameter: 0.5 mm
- Material: PLA (polylactide)

Item No.	536624	EAN	4048962250312
Models	1	Components	890
Dim. (mm)	465 x 160 x 390	Weight (g)	6320



➤ **FACTORY SIMULATION**




Combination of the models Sorting Line With Color Detection, Multi Processing Station With Oven, Automated High-Bay Warehouse and Vacuum Gripper Robot. Self-contained material cycle: workpieces are retrieved from the Automated High-Bay Warehouse, processed in the Multi Processing Station With Oven, then sorted by color in the Sorting Line With Color Detection and finally stored in the Automated High-Bay Warehouse again.

The Factory Simulation is available in both 9V and 24V version:

Item No.: 536629 (9V... / with 5x ROBOTICS TXT Controllers)

Item No.: 536634 (24V... / without controllers)

Item No.	536629 (9V...)	EAN	4048962250367
Item No.	536634 (24V...)	EAN	4048962250411
Dim. (mm)	972 x 772 x 402	Weight (kg)	20.6 (9V...), 19.5 (24V...)

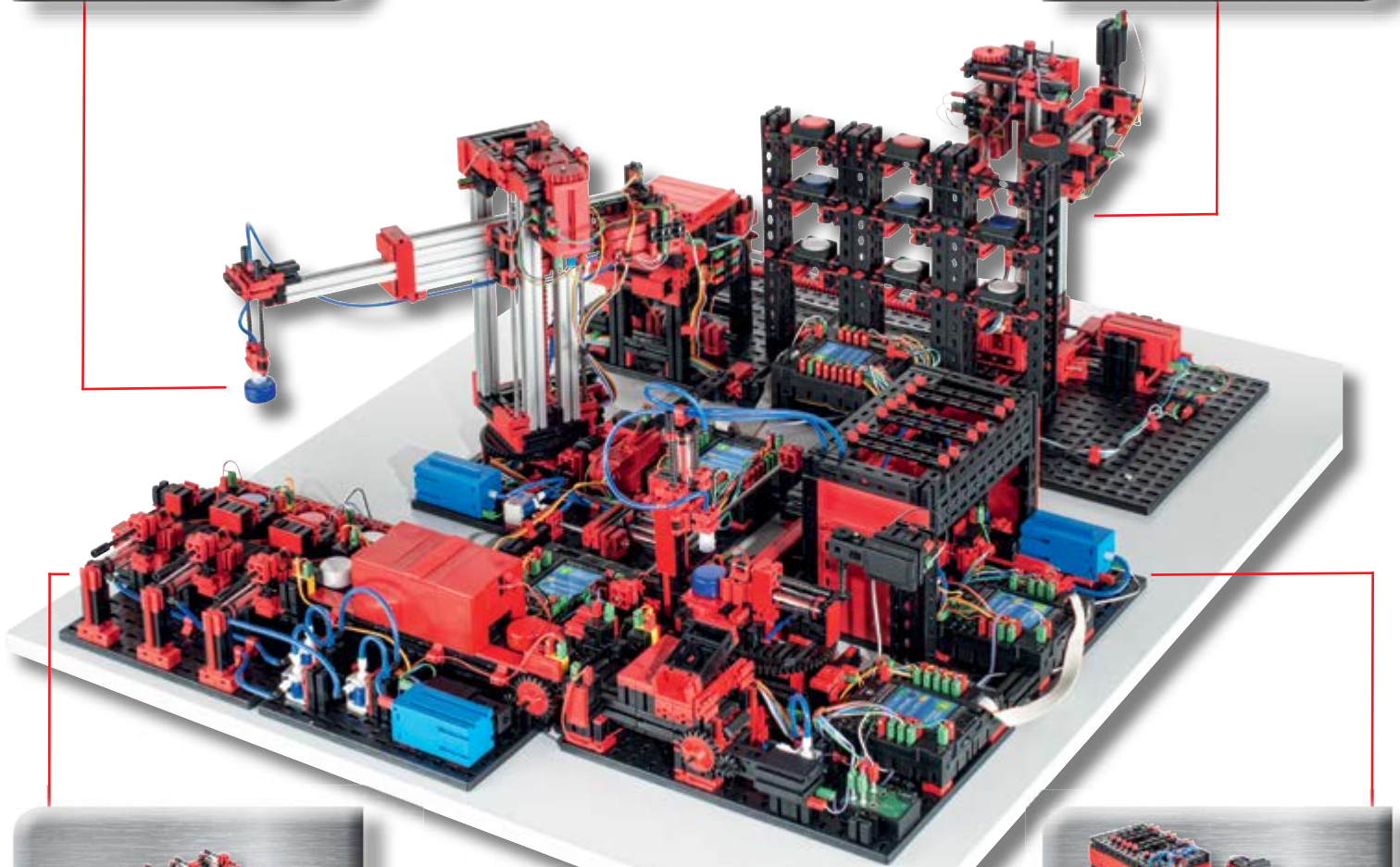
 > **Required for 536629 (9V): 3x Power Supply**
Item No. 505287 (9V/220V) / 122952 (9V/120V)



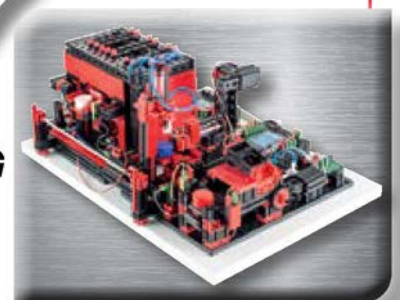
➤ **VACUUM GRIPPER ROBOT**
Page 20



➤ **Automated HIGH-BAY WAREHOUSE**
Page 20



➤ **Sorting LINE WITH COLOR DETECTION**
Page 21



➤ **MULTI PROCESSING STATION WITH OVEN**
Page 21

➤ VACUUM GRIPPER ROBOT

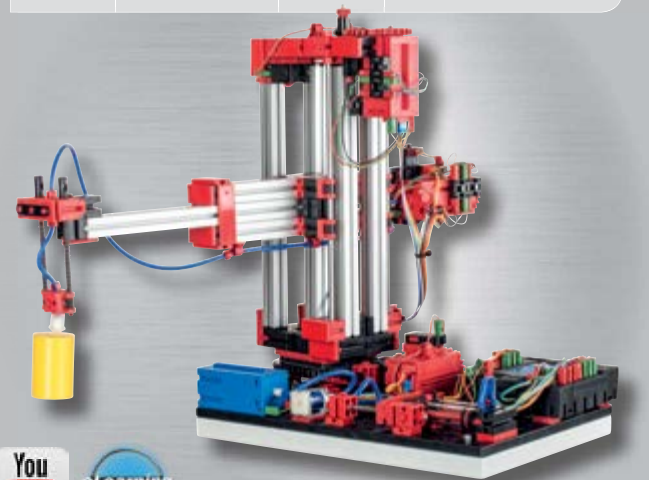
3-axis robot with vacuum gripper works quickly and precisely, positioning workpieces in three-dimensional space. Working range: x-axis 270°, y-axis (forwards/back) 140 mm, z-axis (up/down) 120 mm

- > Incl. instructional activity information (free download)
- > Incl. 3x encoder motors, 3x push buttons (limit switch), vacuum suction device, compressor, solenoid valve
- > Model packed in a robust box

Model available in both 9V and 24V version:
Item No.: 536625 (9V... / with ROBOTICS TXT Controller and controller software ROBO Pro)
Item No.: 536630 (24V... / without controller)

 > **Required for 536625 (9V): 1x Power Supply**
 Item No. 505287 (9V/220V) / 122952 (9V/120V)

Item No.	536625 (9V...)	EAN	4048962250329
Item No.	536630 (24V...)	EAN	4048962250374
Dim. (mm)	222 x 482 x 382	Weight (g)	3300 (9V...), 3120 (24V...)




➤ AUTOMATED HIGH-BAY WAREHOUSE

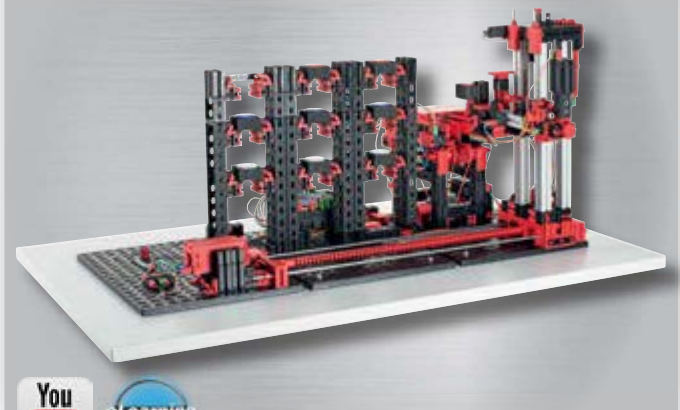
Transfer station with conveyor belt, shelf stacker for storing and retrieving special workpiece carriers, 9 storage slots.

- > Incl. instructional activity information (free download)
- > Incl. 2x encoder motors, 2x mini motors, 4x push buttons (limit switch), 2x phototransistors, 2x lens tip lamps, workpiece carriers, various colored workpieces (6 pcs.)
- > Model packed in a robust box

Model available in both 9V and 24V version:
Item No.: 536626 (9V... / with ROBOTICS TXT Controller and controller software ROBO Pro)
Item No.: 536631 (24V... / without controller)

 > **Required for 536626 (9V): 1x Power Supply**
 Item No. 505287 (9V/220V) / 122952 (9V/120V)

Item No.	536626 (9V...)	EAN	4048962250336
Item No.	536631 (24V...)	EAN	4048962250381
Dim. (mm)	472 x 722 x 382	Weight (g)	8200 (9V...), 8200 (24V...)



➤ IDEAL COMBINATION POSSIBILITIES

	VACUUM GRIPPER ROBOT	AUTOMATED HIGH-BAY WAREHOUSE	MULTI PROCESSING STATION WITH OVEN	SORTING LINE WITH COLOR DETECTION
VACUUM GRIPPER ROBOT		X	X	X
AUTOMATED HIGH-BAY WAREHOUSE	X			
MULTI PROCESSING STATION WITH OVEN	X			X
SORTING LINE WITH COLOR DETECTION	X		X	




eLearning Portal: Go to fischertechnik-elearning.com to find lots of instructional information, animations, tutorials and videos on the individual educational construction sets.

» MULTI PROCESSING STATION WITH OVEN

Furnace with pneumatic sliding door. Downstream processing station with pneumatic transfer unit including vacuum gripper, cutter with rotary table and conveyor belt.

- > Incl. instructional activity information (free download)
- > Incl. 4x mini motors, 6x push buttons (limit switch), 2x phototransistors, 2x lens tip lamps, 4x solenoid valves, compressor
- > Model packed in a robust box

Model available in both 9V and 24V version:
Item No.: 536627 (9V... / with 2x ROBOTICS TXT Controller and controller software ROBO Pro)
Item No.: 536632 (24V... / without controller)

-  > **Required for 536627 (9V): 2x Power Supply**
 Item No. 505287 (9V/220V) / 122952 (9V/120V)

Item No.	536627 (9V...)	EAN	4048962250343
Item No.	536632 (24V...)	EAN	4048962250398
Dim. (mm)	502 x 342 x 302	Weight (g)	4900 (9V...), 4680 (24V...)




» SORTING LINE WITH COLOR DETECTION

Detects workpieces of different colors and sorts them via a conveyor belt into the provided storage unit.

- > Incl. instructional activity information (free download)
- > Incl. 2x mini motors, 5x phototransistors, 5x lens tip lamps, 3x solenoid valves, compressor, optical color sensor
- > Model packed in a robust box

Model available in both 9V and 24V version:
Item No.: 536628 (9V... / with ROBOTICS TXT Controller and controller software ROBO Pro)
Item No.: 536633 (24V... / without controller)

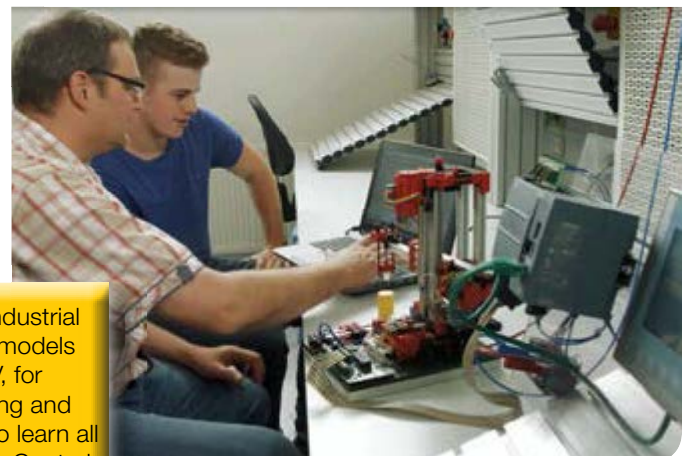
-  > **Required for 536628 (9V): 1x Power Supply**
 Item No. 505287 (9V/220V) / 122952 (9V/120V)

Item No.	536628 (9V...)	EAN	4048962250350
Item No.	536633 (24V...)	EAN	4048962250404
Dim. (mm)	502 x 342 x 302	Weight (g)	4500 (9V...), 4290 (24V...)



24V versions:
Port to PLC: PCB with relays to reverse polarity of motor, multi pin connector (26 pins, grid 2,54 mm) and in addition PCB terminals with push in connection for all I/O.

Pre-assembled industrial type simulation models in 9V and 24V, for Vocational Training and Higher Education to learn all about Automation Control



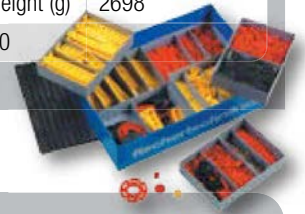


720

► 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.	91082	EAN	4006209910825
Components	720	Weight (g)	2698
Dim. (mm)	390 x 95 x 270		



► 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.	30383	EAN	4006209303832
Components	–	Weight (g)	1889
Dim. (mm)	390 x 95 x 270		



► ACCU SET

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



Item No. 220V	34969	EAN	4006209349694
Item No. 120V	57487	EAN	4006209574874
Item No. 240V UK	79833	EAN	4006209798331
Item No. 240V AUS	52091	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 \dots , 2.5A. Power controller performance data: Controllable output 1A max., additional output with 9V \dots , 1A max. (not controllable), both outputs short-circuit-proof with overload protection.

Item No. 220V	505283	EAN	4048962069440
Item No. 120V	91087	EAN	4006209910870
Components	–	Weight (g)	431
Dim. (mm)	225 x 65 x 150		



45

► MOTOR SET XS

Thanks to the compact measurements, this motor can be installed almost anywhere. In addition to the building blocks, gearbox parts and toothed gears, the set also contains a safety battery tray with integrated pole-reversing switch for 9V block batteries (battery not included).
> Performance data: Voltage 9V, max. output 1.0W at 6000RPM

Item No.	505281	EAN	4048962069426
Components	45	Weight (g)	201
Dim. (mm)	225 x 65 x 150		



40

► MOTOR SET XM

High performance geared motor in compact plastic casing with numerous possibilities for attachments. With many toothed gears, axles and gearbox parts.
> Performance data: Voltage 9V, max. output 3.0W about 340RPM
> **Required: Accu Set or Power Set**

Item No.	505282	EAN	4048962069433
Components	40	Weight (g)	278
Dim. (mm)	225 x 65 x 150		



► BT CONTROL SET

The Bluetooth Control Set makes it possible to control fischertechnik models remotely using the included remote control or a smartphone or tablet. Bluetooth low energy technology offers a long range of up to 10 meters. Control up to three motors and one servo motor. Steering angle and speed control are infinitely variable. Remote control can be operated with up to two receivers, allowing for numerous applications. > **Required: Accu Set and 9V block (battery not included)**

Item No.	540585	EAN	4048962280043
Components	–	Weight (g)	400
Dim. (mm)	225 x 65 x 150		



➤ **BMA Schools Thailand / Learning Center Taiwan**



➤ **Vocational Schools Germany**



➤ **fischertechnik Robotics Cup Germany**



➤ **fischertechnik teams at RoboCup World Cup**



➤ **University Competition China**





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COMPUTING