

DEVELOPER AND PRODUCER:
Brain Development Ltd.,
St. Petersburg,
RUSSIA



OUR ACHIEVEMENTS

✓ **Brain Development Ltd. (St. Petersburg)** is a system integrator in the sphere "Development of robotics in Russia" and a resident of the cluster "Development of information technologies, radioelectronics, instrumentation, communications and telecommunications of St. Petersburg".

✓ May 17, 2017 Brain Development Ltd. became a winner of the annual Prize "The Impulse of Goodness" for its contribution to the development and promotion of social entrepreneurship in Russia. The prize was established by the Foundation for Regional Social Programmes "Our Future".



✓ On October 21, 2015 Brain Development Ltd. was awarded the National Quality Mark Prize; the latter was presented at the special awards ceremony, in recognition of the achievements "ECONOMIC SUPPORT OF RUSSIA", with award of an honorary title "HIGH QUALITY STANDARD".



ВСЕРОССИЙСКАЯ ПРЕМИЯ
НАЦИОНАЛЬНАЯ
МАРКА КАЧЕСТВА

OUR ACHIEVEMENTS

- ✓ Brain Development is a developer and producer of the robotic complex **ROBOTRACK** for the educational system, from kindergarten to the university, being a managing company for institution of International network of Robotrack educational robotics centers.



- ✓ Within the framework of the Children's Goods Industry Congress, on September 29, 2017, a ceremony of awarding the best national producers took place. By the results of the Rating competition of the Ministry of Industry and Trade of the Russian Federation, the company Brain Development entered the TOP-10 of the best Russian producers.



- ✓ **Brain Development Ltd.** is an official representative of the International Youth Robotic Association **IYRA** in Russia.





The Robotrack project was supported by the Agency for Strategic Initiatives (ASI) (Moscow).

Brain Development Ltd. is a winner of the International Competition "Innovations and Development" in the nomination "Innovations in education" and entered the list of top 100 enterprises and organizations of Russia.



In March 2016, Brain Development Ltd. became a winner of the 1st cross-sectoral competition of producers and suppliers of educational equipment and teaching aids for supplementary education, extracurricular, cultural and leisure activities "The Teachers' Choice". The Robotrack robotic complex was awarded the status of "Recommended by the pedagogical community". In 2017, the Resource kits NEUROTRACK and VIDERETRACK got a mark of distinction "Recommended by the pedagogical community".

Brain Development Ltd. (St. Petersburg) is a resident of the cluster "North-West Federation of Innovative Educational Projects".



The project is implemented with the support of the Foundation for assistance to small business in the scientific and technical sphere.

Brain Development Ltd. (St. Petersburg) is an official organizer of the All-Russian stage of robotic competitions for preschoolers and schoolchildren "DETAL'KA" within the framework of International competitions IYRC.





KIDDY KIT

4-6 y.o.



INTERN A
KIT

7-9 y.o.



YOUNG
DISCOVERY
KIT

10-11 y.o.



ROBOTRACK
BASE KIT

12+ y.o.



ENGINEER
KIT

12+ y.o.

RESOURCE KIT

Allows you to extend the capabilities of the construction toy sets

- Neurotrack
- Videretrack
- Metal
- Fasteners
- Wheels and caterpillars
- Temperature sensor
- Kiddy project
- Bending sensor
- Servomotor
- DC motor
- Trackduino
- Color TFT display
- Plastic
- Sensors
- Worm gear
- Energytrack
- Audiotrack





Resource kit «NEUROTRACK» (for realization of neurotechnology)

Presentation of the construction kits line to the journalists and representatives of the Ministry of Industry and Trade of the Russian Federation (August 2016)



Presentation of a project Neurofan (July 2016)

THE FORUM OF STRATEGIC INITIATIVES



Resource kit «VIDERETRACK» (for realization of computer vision technology)

The toolkit will allow to create projects with:

- Recognition of objects (face);
- Tracking the guide line;
- Detection of graphic primitives (circumferences);
- QR-codes recognition;
- Detection of movement;
- Analysis of the color chart of a frame;





ROBOTRACK ROBOTIC COMPLEX IS A NEW EDUCATIONAL SOLUTION

The comprehensive solution for creating the Robotics line in the educational organization includes:

- methodological support (manuals) for pedagogues;
- workbooks for children;
- material and technical supply with new-generation construction kits;
- software;
- robotic modules designed for competitive events;
- training courses for pedagogues on organization of educational process and maintenance of the equipment: 72 hours - basic course, 36 hours - module courses.



The complex is designed for a course in educational robotics, additive technologies, computer vision and neurotechnologies, is integrated with subjects of natural/mathematical and physical/technological cycles.

All the methods provide for a possibility for variable learning, full continuity, are designed for children of the following ages (4-5 years, 5-6 years, 7-9 years, 10-12 years, 12-17 years) and have a due structure and configuration.



Developed educational complex (educational programmes)

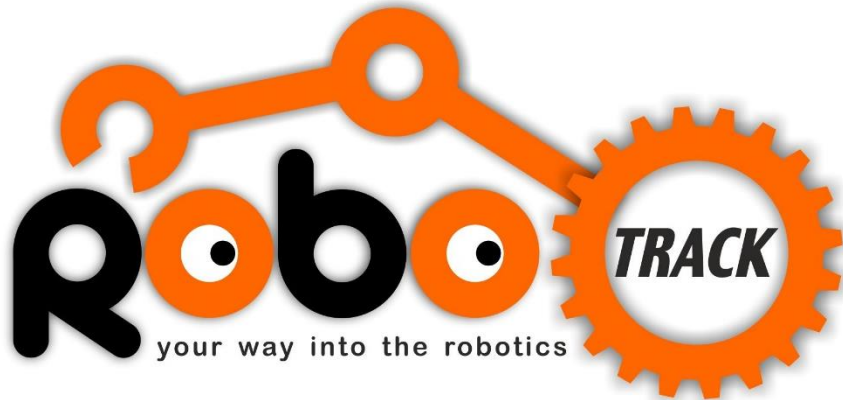
The main goal of the developed programmes:



- additional motivation of schoolchildren to study physics, mathematics, computer science, selection of engineering specialties;
- formation of learners' scientific, technical and engineering thinking;
- formation of competences for professions of the future (early career guidance);
- career planning in industrial production.

The structure of the programs-traces includes:

- ✓ description of relevance of the programme development;
- ✓ timing of the programme;
- ✓ contents of the programme;
- ✓ methods of teaching and organization of the educational process
- ✓ abstract of the programme with a list of topics and sections
- ✓ a list of recommended or used literature
- ✓ methods of realization of the programme
- ✓ pedagogical principles underlying the training
- ✓ material and technical conditions for realization of the programme
- ✓ educational and thematic plan
- ✓ a list of core competencies for a trainee to be mastered by the end of the course



I. A LEARNING KIT FOR CHILDREN AGED 5-6 WITH SENSORY IMPAIRMENTS, INCLUDING THOSE WITH IMPAIRED VISION, AMBLYOPIA AND SQUINT



THE LEARNING KIT COMPRISES THE FOLLOWING

WORK PROGRAMME for development of constructive skills, correction of visual perception of children with sensory impairments by means of a robotic construction kit. The programme is realized through a continuous educational activity, organized as working with 2-6 children. The models intended for assembly in constructive activity are grouped into 4 thematic modules.

GUIDANCE MANUAL Development of Constructive Skills and Correction of Visual Perception of Children with Sensory Impairment by Means of the Construction Kit "MRT1 HAND" (children with impaired vision, amblyopia, squint). A total of 40 classes have been developed, with specified didactic games, applications in the form of electronic presentations separately for every lesson.

DIDACTIC MATERIAL

PEDAGOGUE'S AID:

a table of models for designing and modelling in educational activities involving children having sensory impairment, aged 5-6 years (40 models).

LEARNER'S AID:

model assembly charts (assembly charts for 40 models).

A number of unique unparalleled methods have been designed for inclusive education in the sphere of educational robotics.

II. LEARNING KIT INTENDED FOR CHILDREN AGED 5-8 HAVING HEALTH LIMITATIONS, INCLUDING SPECIFIC METHODS FOR CHILDREN WITH INTELLECTUAL DISABILITIES, DEVELOPMENTAL DELAY)



The learning complex "Designing Based on Robotic Construction Kits "MRT 1 BRAIN A", "MRT 1 BRAIN B" for children aged 5 - 8 was developed on the basis of the Federal State Educational Standard of Pre-school Education (FSES for pre-school education 2013) and the Federal State Educational Standard of Primary General Education for learners with disabilities (FSES for health limitations learners - 2014); is intended for use in pre-school institutions of inclusive character, as well as in inclusive classes of primary school.

THE LEARNING KIT COMPRISES THE FOLLOWING

WORK PROGRAMME: Acquaintance with the surrounding world within the framework of this programme supposes formation of a holistic view of children in the subjects to be constructed.

GUIDANCE MANUALS

1. «Teacher's Workbook for working with Construction Kit MRT 1 BRAIN A» (basic level).
2. «Teacher's workbook for working with Construction Kit MRT 1 BRAIN A + MRT 1 BRAIN B» (advanced level).

DIDACTIC MATERIALS:

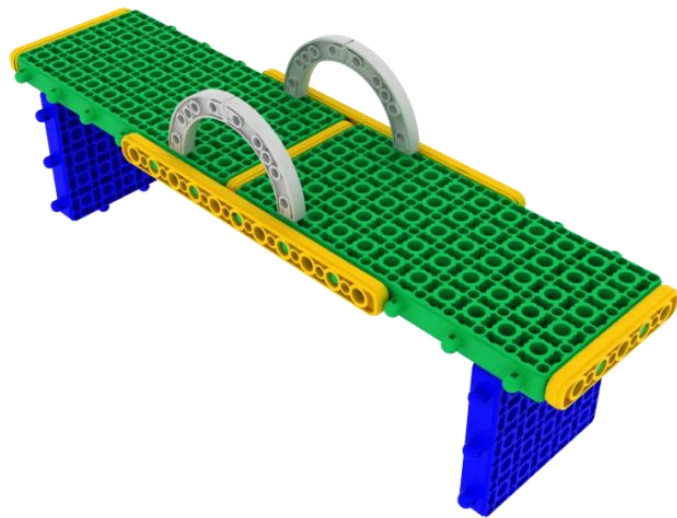
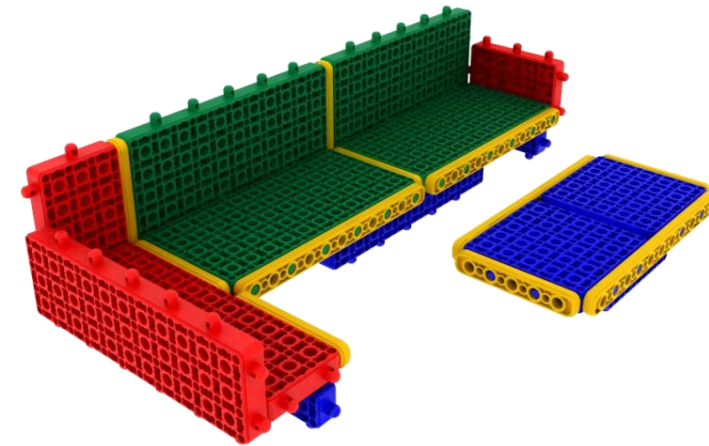
PEDAGOGUE'S AID:

1. Table of models for designing and modelling for children aged 5-8 years (16 models of entry level + 16 models of basic level).
2. Table of models for designing and modelling for children aged 5-8 years (16 models of entry level + 16 models of basic level + 16 models of advanced level).

LEARNER'S AID:

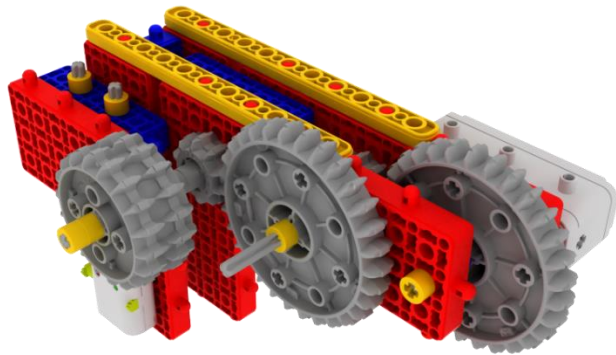
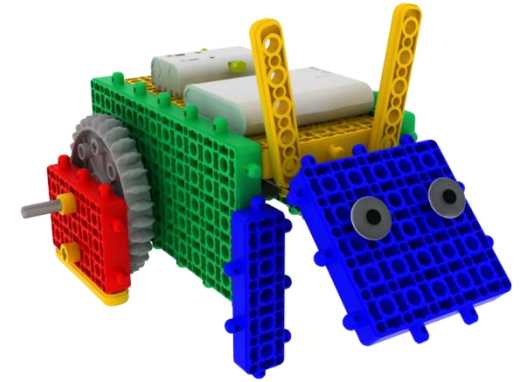
1. Model assembly charts. Basic level (assembly charts for models MRT 1 BRAIN A).
2. Model assembly charts. Advanced level (assembly charts for models "MRT 1 BRAIN A + MRT 1 BRAIN B").

Module 1 - preparatory. Formation of ability to work with a system of sensory standards, development of motor skills necessary for a robotic complex. The classes include the work within sensory education, aimed at development of visual-efficient, visual-figurative thinking, extension of knowledge about the surrounding world, formation of ability to combine construction kit parts in a simple structure, 16 classes 25-30 minutes each, for normally developing children and those with health limitations (32 hours), execution of elementary structures.

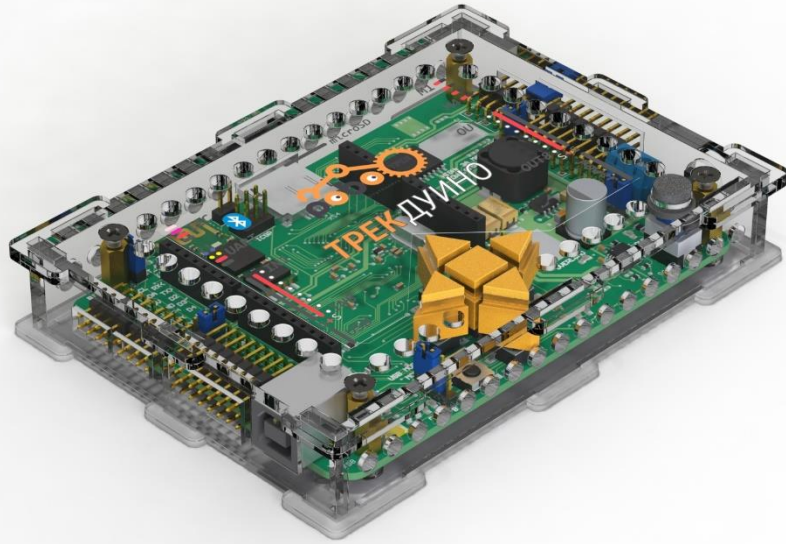


Module 2 - initial. Formation of ability to connect the construction kit parts in accordance with the chart, with the pedagogue's help. The classes included the work within sensory education, development of visual-figurative thinking, extension of the knowledge how to use the finished structure in playing, 16 classes for normally developing children and those with health limitations (32 hours), construction according to the chart on the basis of the construction kit.

Module 3 - basic. Formation of ability to work according to the chart with the construction kit. The classes include the work aimed at development of visual, imaginative and logical thinking, formation of ideas about the dynamic use of the finished structure in playing, 32 classes 40-60 minutes each, for normally developing children and those with health limitations, aged 7–8; construction is made according to the charts based on the models of the construction kit MRT 1 BRAIN A, MRT 1 BRAIN B.



Module 4 – creative. The construction is made in accordance with the joint creative plan designed with the parents, is carried out without a chart, the specification of structures will be designed with the parents.

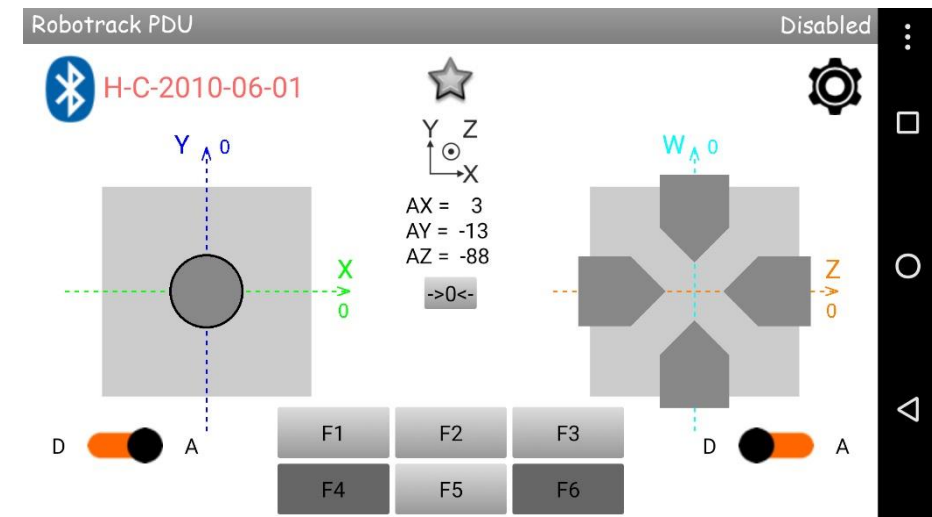


Trackduino – a multi-functional controller, whose heart is the microcontroller Atmega2560. The controller has everything necessary to implement various robotic projects:

- Drivers for 4 engines.
- Well thought-out power system.
- Power on all external ports.
- Interfaced Arduino Uno for connecting Arduino-compatible expansion cards.
- Full compatibility with libraries and examples for Arduino.

The controller has several ports for connecting external devices. The ports IN and OUT are absolutely independent of all other ports, including the ports of Arduino Uno interface.

"Robotrack PDU" is an application for smartphones and tablets running on Android 4.0 or higher. It helps to control the robot based on Trackduino controller remotely via Bluetooth, in which the smartphone / tablet is used as a console.



FOR PRESCHOOL EDUCATION



Kiddy Kit II



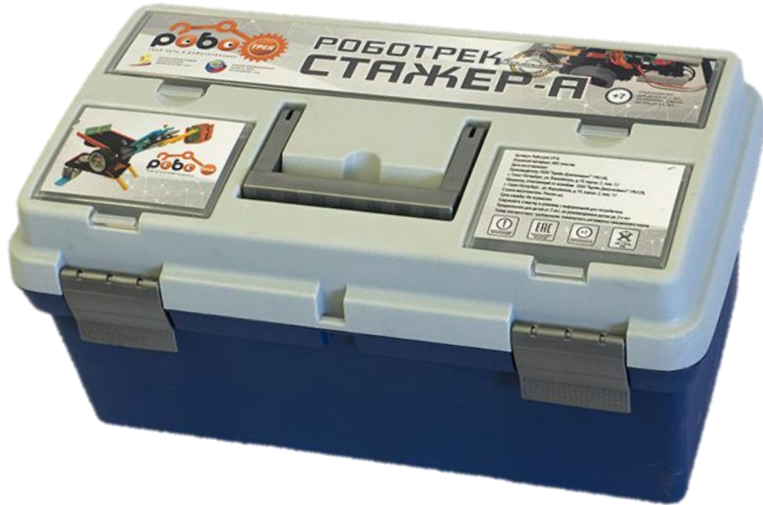
Kiddy Kit I



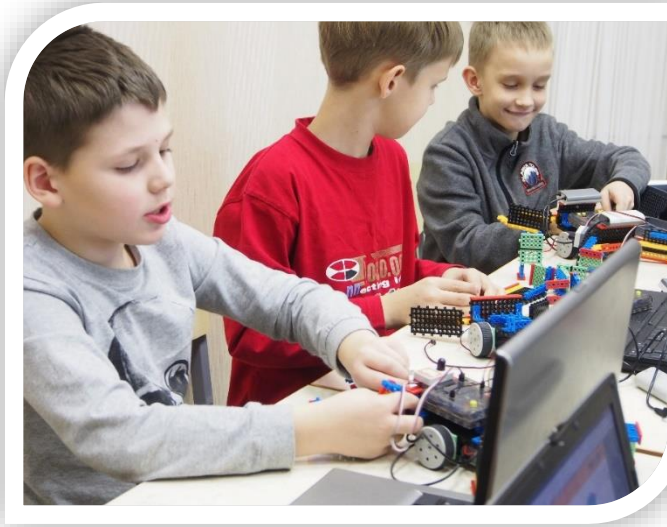
**Resource Kit
«Kiddy Project»**

- ✓ The kit includes **two motherboards**: non-programmable and programmable.
- ✓ Not less than **40 models** for each Kiddy Kit.
- ✓ A **unique** educational and methodical complex adapted for preschool children.
- ✓ Helps to form the first skills of designing, develops the fine motor skills of children aged 5-6 years with the use of blocks of the construction toy set "Robotrack".

FOR BASIC GENERAL EDUCATION AND ADDITIONAL EDUCATION (7-9 years old)



Intern A



**Resource Kit
«Sensors»**



**Resource Kit
«Neurotrack»**



Fascinating presentation of teaching material

The educational-methodical complex is developed according to this age group



Three motherboards

1 unprogrammable and 2 programmable
(baseline + advanced)



Develops spatial thinking

The plastic details of the constructor are connected on six sides, which allows creating 3D models



Minimal number of constructor details – **667**.



Minimal number of sensors – **11**.

**FOR BASIC GENERAL EDUCATION AND ADDITIONAL EDUCATION
(7-9 years old)**



INTERN A

Educational Construction Toy “INTERN A” is equipped with methodical recommendations and:



1. Allows to form the basic skills of programming and understanding the work of real structures and mechanisms. Simple software and detailed instructions help to design and program a variety of robot models presented in the Intern A Kit.



2. Contains not less than **70 detailed instructions** for assembling the models.



3. Elements of the designer are made of a durable material, it can be used in any robotic design.

FOR BASIC GENERAL EDUCATION AND ADDITIONAL EDUCATION (12+ years old)



Minimal number of constructor details – 828.



Resource Kit
«Videretrack»



Resource Kit
«Sensors»



Resource Kit
«Metal»



Resource Kit
«Neurotrack»



Robotrack
Base kit



Minimal number of sensors – 11.



A **separate unique** studying course of **technical vision** on the basis of the resource kit "Videretrack" and the Base kit + Sensors.



You can use electronic components of other manufacturers based on the Arduino platform.

Line of educational construction toy in robotics, neuroscience, systems of computer vision and additive technology "**ROBOTRACK**"

**FOR BASIC GENERAL EDUCATION AND ADDITIONAL EDUCATION
(12+ years old)**



Robotrack Base Kit



Allows to study the basic principles of robotics and the theoretical foundations of mechanics, physics, computer science, studying the principles of the operation of sensors and execution unit, and the operation of the controller.



Not less than **60 detailed instructions** for assembling the models.



Sensors included in Robotrack Base Kit: 3 IR sensors, CDs sensor, remote control sensor, 2 touch sensors, colour&light sensor, touch sensors, 2 external encoders, ultrasonic distance sensor.



Elements of the construction toy set are made of a durable material, it can be used in any robotic design.

Pedagogical expediency of using trajectory programmes in conjunction with the first Russian educational construction kit ROBOTRACK



A trajectory programme for children of 5-6 years old is formed in accordance with the principle of continuity of education. From the point of view of pedagogy, the formation of scientific and technical (subsequently - engineering) thinking should be developed from the preschool age.

The classes in the form of a game according to the programme make it possible to form the first skills of designing and development of manual dexterity of hands in children aged 5-6, with the use of Robotrack construction kit blocks.

The possibility of adding blocks from six sides makes it possible to collect volumetric constructions with a minimum of details and will help to form and develop not only logic, but also spatial thinking.

Children of 5-7 years old, by designing projects, develop technical creativity, basic cognitive processes (memory, attention, thinking).

More than 70 ready-made digitized programmes based on ROBOTRACK software enable the learner to acquire the primary skills for further study of the fundamentals of algorithmics and programming, to form the primary concepts of 3D modelling.

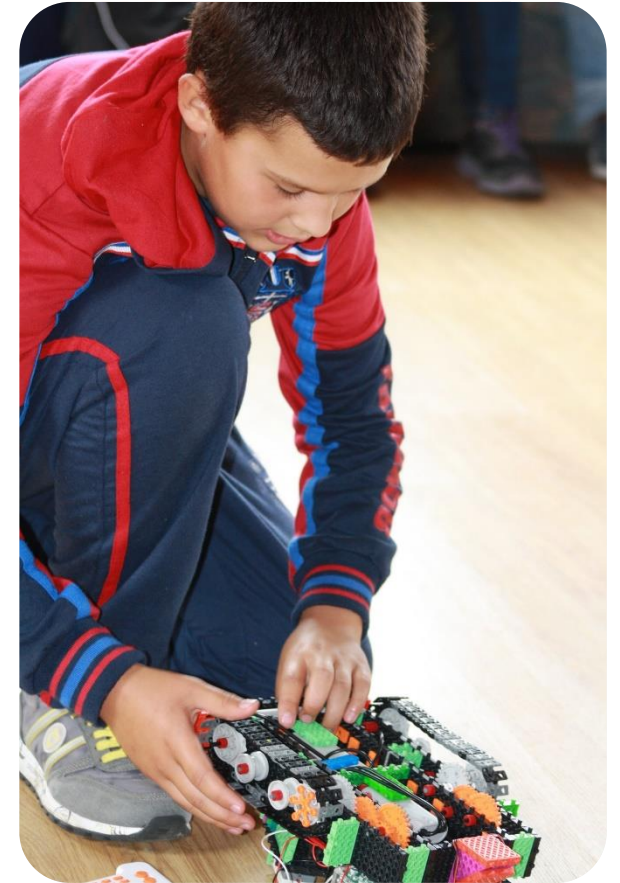


Pedagogical expediency of using trajectory programmes in conjunction with the first Russian educational construction kit **ROBOTRACK**

Educational trajectory programme for children aged 11-14 years old.

It helps to form the basic programming concepts required for mastering the educational robotics and to comprehend the operation of serious structures and mechanisms. The simple software and detailed instructions help to design and programme a variety of robot models presented in the ROBOTRACK construction kit.

The construction kit elements are made of durable material; their robust frame can be used in any robotic project. The main sensors of the robotic construction kits make it possible to simulate a production process, to develop prototypes of automated production lines and sites, to carry out research work, to arrange movement of assembled models along complex trajectories, to implement real technologies used in technical equipment and production processes. The content of module 1 is focused on formation of knowledge about the existing automated systems in everyday life and in production and the basics of project development. The content of module 2 is focused on competitive events and acquaints one with the main competitions. The classes within the framework of modules 1 and module 2 are structured with regard for the basic knowledge of educational robotics.



Pedagogical expediency of using trajectory programmes in conjunction with the first Russian educational construction kit ROBOTRACK

Educational trajectory programme for children aged 15-17.

The project trajectory for this age is aimed at acquiring numerous key skills, specifically in the area of creative and critical thinking, enables one to acquire "metacognitive skills", will let one develop such necessary qualities of a modern specialist as ability of communication and cooperation, modelling and design skills, lays the basics of scientific and technical thinking that are important for technosphere specialists at the present stage of the development of the society.

The programme (MODULE 1), analyzing the basic parameters of designing and modelling of structures, explaining the main technologies used in production, will help to orientate the learners within the technical specialties.

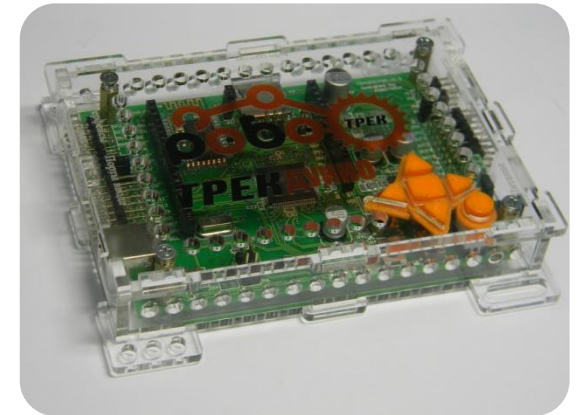
The content of MODULE 2 is focused on competitive events, acquaints one with basic competitions. The classes of modules 1 and 2 are designed within the framework of advanced level of educational robotics.



ROBOTRACK is the first Russian new-generation robotic **construction kit** that meets FSES requirements for educational robotics, from **kindergarten** to the **university**. The new line of construction kits makes it possible to realize the continuity in training and is aimed at formation of scientific, **technical** and engineering thinking of learners.



ROBOTRACK construction kit is based on the microcontroller Trackduino (compatible with Arduino).



100 flow charts have been developed **for preschoolers** – they get acquainted with the basics of algorithmic and logic without having programming skills, at the age of 5. The main flow charts are already "embedded" in the mainboard.

The multifunctionality of the controller, as well as the ability to connect and control external equipment, makes it possible to extend the use of the circuit board for the subjects "TECHNOLOGY", "PHYSICS", "CHEMISTRY", "BIOLOGY", "MATHEMATICS", "COMPUTER SCIENCE" in the primary and secondary school. Possibility to connect external equipment: sensors, boards and expansion modules, electric motors, etc. promotes research and design activities in the profile school (10-11 study years): for chemical-biological, physical-mathematical, socio-economic profiles.



Following the principle of systemacity, consistency and continuity, it is advisable to start engineering education at the preschool age. ROBOTRACK robotic complexes will help to form and develop, in the form of a game, not only logic, but also spatial thinking, which is a basis for the most part of engineering and technical specialties.

Children of 5-7 years, when designing projects, develop fine motor skills, memory and attention. Construction kits allow them to get a basic idea of science and technology. They get acquainted with the basics of research work already at this age, which is stipulated by the requirements of FSES for preschool education.



The preparatory group classes provide for the principles of propaedeutics in educational robotics.





A ROBOTIC COMPLEX LINE FOR PRESCHOOLERS HAS BEEN DEVELOPED, BEING REPRESENTED BY 3 TYPES OF CONSTRUCTION KITS:

- ✓ KIDDY KIT I;
- ✓ KIDDY KIT II;
- ✓ KIDDY PROJECT.

The peculiarity of assembling parts on all 6 sides makes it possible to form and emulate projects and models in different planes, thereby stimulating the development of spatial thinking and logic. The design activities with ROBOTRACK construction kits make it possible to acquire the necessary skills that are primary for further work with robotic construction kits and in the sphere of robotics in junior school.

**KIDDY KIT I**

The kit includes not less than 277 elements:

- 1) plastic mounts of different shape and blocks (for constructing objects)
- 2) wheels - 4 types
- 3) gears - 4 types
- 4) a kit of shafts, plugs and couplings
- 5) **2 motherboards** (controllers) for non-programmable level (4 programme algorithms embedded) and programmable level (visualized software for ROBOTRACK)
- 6) 2 DC motors
- 7) 2 touch sensors and 2 infrared sensors
- 8) USB cable, 2 cases for batteries 6 and 9V
- 9) ROBOTRACK software, instructions, a minimum of 39 ready files for upgrading TRACKDUINO board with algorithms for programming robots, on condition of availability of a "Kid project" kit as a supplement (in open access)
- 10) disassembly key
- 11) frames of 3 types
- 12) a kit of levers, arcs and angles
- 13) 4 rubber plates

The kit includes not less than 302 elements

- 1) plastic blocks of 9 types of different shape for objects construction
- 2) wheels - 4 types
- 3) gears - 4 types
- 4) a kit of angles, arcs, mounts, shafts, plugs and couplings
- 5) **2 motherboards** (controllers) - 1 upgraded with 4 algorithms with a possibility of remote control and 1 programmable (visualized environment of ROBOTRACK software)
- 6) 2 DC motors
- 7) a kit of various sensors - 2 infrared sensors, 1 remote control reception sensor, 1 sound sensor
- 8) USB cable
- 9) 2 cases for batteries 6 and 9V
- 10) remote control panel
- 11) ROBOTRACK software, instructions, a minimum of 39 ready files for upgrading TRACKDUINO board with algorithms for programming robots on condition of availability of a "Kid Project" kit as a supplement (in open access)
- 12) 3 types of frames, motor mounting
- 13) rubber plates



KIDDY KIT II



The kit consists of at least 26 elements:

- 1) 1 servomotor, frames for the servomotor
- 2) a kit of different sensors - 3 infrared sensors, 1 light sensor, 1 remote control sensor, 2 touch sensors, 1 speaker, 1 piezo-emitter, 1 sound sensor, 3 tilt sensors, 1 vibration sensor, 1 fire sensor, 1 magnetic field sensor , 1 color + light intensity sensor, 1 ultrasonic distance sensor
- 3) 3 types of LED modules
- 5) 2 frames for servomotors
- 6) 2 types of servojets

ROBOTRACK IN THE SYSTEM OF GENERAL AND SUPPLEMENTARY EDUCATION

The junior schoolchildren acquire practical skills of design and modelling within the framework of realization of the main technosphere components; they also master the basics of algorithmic and get the primary knowledge of simple structures and mechanisms, as provided by FSES for primary general education.



The use of ROBOTRACK for schoolchildren assumes project activity at the lessons of mathematics, physics, chemistry, biology, computer science, technology in secondary (basic school) and in profile education, allowing to carry out all kinds of laboratory research and to master the basics of research work, which assumes formation of design skills, modelling skills and learning the basics of experimental activity according to FSES for general education.

A robotic complex line **for schoolchildren** has been developed, being represented by 2 types of construction kits:

- ✓ INTERN A KIT (7-9 y.o.);
- ✓ ROBOTRACK BASE KIT (12+ y.o.).



The construction kits help, **in the secondary and senior school**, to master the basics of programming and to understand the operation of mechanisms. The simple software and detailed instructions help to design and programme a variety of robot models presented in the kit. The construction kit elements are made of durable material; their robust frame can be used in any robotic project. The main sensors of the robotic construction kit make it possible to simulate a production process, to develop prototypes of automated production lines and sites, to carry out research work, to arrange the movement of assembled models along complex trajectories, to implement real technologies used in technical equipment and in production processes.



The complex solution of ROBOTRACK was drafted with account of RF President's Decree of September 4, 2014.

"On Approval of the Concept for Development of Supplementary Education for Children" and in pursuance of:

1. The decisions of the National Coordination Council for support of young talents of Russia within the framework of the Russian Federation Presidential Decree as of May 7, 2012 No. 599 (paragraph 5 of subclause "в" in clause 1 of the Decree).
2. Concept realization plan for the years 2015-2020 on development of supplementary education for children.
3. "Complex of Measures for Realization of the Concept for Development of Supplementary Education for Children", part II, clauses 2.1, 2.2; part III, clauses 3.3, 3.5; part V, clause 5.2; part VI, clauses 6.1, 6.2, 6.3, 6.4, 6.5.

THE CONSTRUCTION KITS CAN BE USED IN VARIOUS CHILDREN'S AND YOUTH COMPETITIONS IN ROBOTICS.

ERR-
Engineering
Resources
of Russia



**ROBOTRACK ROBOTIC COMPLEX IS A EDUCATIONAL SOLUTION FOR
REALIZATION OF THE GOVERNMENT POLICY IN THE SPHERE OF EDUCATION
AND SCIENCE.**

Robofinist



**Free categories of
ROBOFEST**



All-Russian and International robot competitions of IYRC format.



Brain Development Ltd. is one of the organizers of team participation in the International competitions of robots and has a unique experience of forming winner teams and training participants within the framework of IYRC.

ALL-RUSSIAN AND INTERNATIONAL ROBOT COMPETITIONS OF IYRC FORMAT

The annual International robotics festival-marathon for preschoolers and junior schoolchildren "DETAL'KA" is held within the framework of international cooperation in the sphere of development of educational robotics, with the International Youth Robot Association (IYRA), and represents the All-Russian stage of IYRC International Youth Robotic Competitions (the Association includes more than 19 countries of the Asian and Pacific Region; the competitions are an alternative to European Robotics Competition).



The organizer of the Festival is Brain Development Ltd.

The festival "DETAL'KA" is aimed at formation of scientific, technical and engineering thinking of learners and is focused on stimulating and motivating today's schoolchildren and preschoolers towards the future choice of technical professions

In 2015, the festival "DETAL'KA" was included in the Collection "Practical Guide for Complex Patriotic Celebration of the Victory in the Great Patriotic War of 1941-1945", issued by the Ministry of Education and Science of the Russian Federation.

The robotic competition "DETAL'KA" is held with support of the Russian Academy of Education, Institute of Mathematics, Computer Science and Natural Sciences under Moscow State Pedagogical University, Association of Strategic Initiatives under the President of the Russian Federation, Agency for Innovation Development, Association of ART Industry and the network of ROBOTRACK centres.



In 2016, Robotics Festival "DETAL'KA" collected over 300 participants from Moscow and St. Petersburg, Kaluga and Bryansk, Penza and Tula, Sestroretsk and Novosibirsk, Ufa and Satka, Omsk and Sevastopol, Stavropol, Kazan, Naberezhnye Chelny, Kursk, Togliatti, a number of cities in Yakutia and Bashkortostan, Kazakhstan.

In 2017, over 400 children from 40 cities of Russia and Kazakhstan visited the Robotics Festival "DETAL'KA". Since 2017, "DETAL'KA" has been held as a festival on educational robotics and neurotechnologies.

Brain Development is a system integrator of the International network of robotics clubs ROBOTRACK and undertakes turnkey clubs projects. THE CLUB NETWORK comprises more than 128 clubs in more than 47 cities of Russia and Kazakhstan.



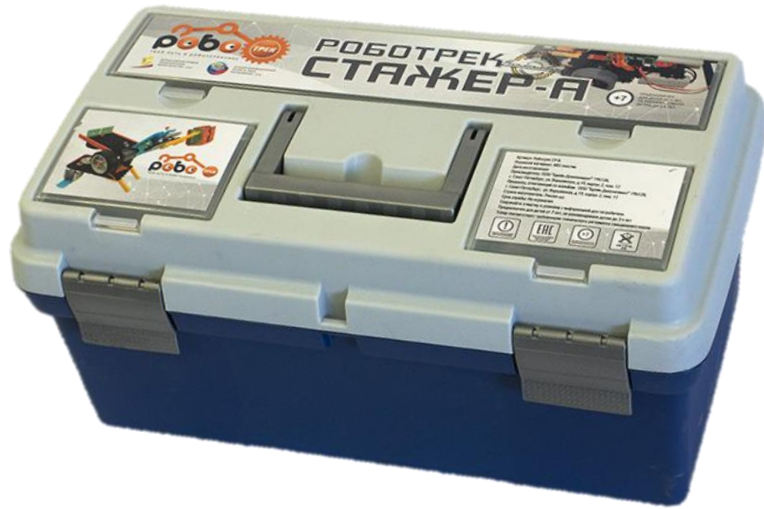
The covered cities are:

1. St. Petersburg
2. Chelyabinsk region
3. Moscow
4. Voronezh
5. Vladivostok
6. Irkutsk
7. Kursk
8. Kaluga
9. Kemerovo
10. Novosibirsk
11. Omsk
12. Perm



13. Saratov
14. Sevastopol
15. Sestroretsk
16. Tobolsk
17. Taganrog
18. Tyumen
19. Ufa
20. Ulan-Ude
21. Ussuriisk
22. Khabarovsk
23. Yakutsk
24. Stavropol
25. Novokuznetsk
26. and others.

THE LINE OF CONSTRUCTION KITS FOR GENERAL AND SUPPLEMENTARY EDUCATION



Intern A

The kit contains at least 667 elements:

- 1) plastic mounts of different shape (4 types), blocks (5 types) for objects construction
- 2) wheels - 5 types
- 3) gears - 3 types, a set of chains for chain tracks
- 4) set of plastic shafts (4 types), plastic plugs, plastic and rubber couplings, iron bolts (three sizes) and nuts, washers.
- 5) a kit of flat plastic frames (3 types) and rubber adapters (2 types)
- 6) 3 motherboards (controllers): 2 boards for the initial level (upgraded and programmable) and 1 board for advanced level
- 7) 2 DC motors and 2 servomotors
- 8) a kit of various sensors - 6 types of sensors: 3 infrared sensors, 1 remote control sensor, 1 light sensor, 2 touch sensors, 1 piezo-emitter, 1 sound sensor

- 9) two LED modules
- 10) USB cable for advanced-level board and USB for entry-level board
- 11) 2 cases for batteries 6 and 9V
- 12) 1 remote control
- 13) a screwdriver, a wrench
- 14) ROBOTRACK software, instructions, a minimum of 39 ready files for upgrading TRACKDUINO board with algorithms for programming robots, provided that the ROBOTRACK SENSORS kit is available as a supplement (in open access)

THE LINE OF CONSTRUCTION KITS FOR GENERAL AND SUPPLEMENTARY EDUCATION

The kit includes not less than 651 elements:



YOUNG DISCOVERY KIT

- 1) plastic mounts of different shape (6 types), blocks (9 types) for objects construction
- 2) wheels - 4 types
- 3) gears - 4 types, a set of chains for chain tracks
- 4) a kit of plastic shafts (4 types), plastic plugs, plastic and rubber couplings, iron bolts (4 sizes) and nuts, washers
- 5) set of flat plastic frames (3 types)
- 6) 2 motherboards (controllers): 1 board for the initial level (upgraded with 4 algorithms) and 1 board for advanced level
- 7) 2 DC motors and 2 servomotors
- 8) set of various sensors - 6 types of sensors: accelerometer-gyroscope, color sensor + light sensor, ultrasonic, IR sensor, touch sensor, external encoder
- 9) 2 worm gears
- 10) USB cable for advanced-level board and USB for entry-level board
- 11) 2 cases for batteries 6 and 9V
- 12) a screwdriver, a wrench
- 13) CD with instructions for beginner level
- 14) ROBOTRACK software in open access

THE LINE OF CONSTRUCTION KITS FOR GENERAL AND SUPPLEMENTARY EDUCATION

The kit includes not less than 828 parts:

1. Plastic mounts of different shape (5 types), blocks (11 types) for objects construction;
2. Metal blocks of different shape (10 types);
3. Wheels - 5 types;
4. Gears - 4 types, levers and plastic angles, a set of chains for chain tracks;
5. A kit of plastic (4 types) and metal (3 types) shafts, plastic plugs; plastic, rubber and metal couplings, iron bolts (three sizes) and nuts, washers;
6. A kit of flat plastic frames (3 types) and rubber adapters (2 types);
7. Set of three-dimensional rectangular connecting mounts (2 types);
8. A kit of plastic pins of 5 sizes and devices for installation of pins;
9. 1 motherboard for advanced level;
10. 2 DC motors and 1 servomotors for advanced level and 2 external encoders;
11. A kit of various sensors (6 types);
12. USB cable for the advanced board and a programmer for the main board;
13. 9V battery case;
14. Remote control panel;
15. A screwdriver, a wrench, extension wires for sensors;
16. ROBOTRACK software, instructions, at least 39 ready-made files for upgrading TRACKDUINO board with algorithms for robots programming, provided the ROBOTRACK SENSORS kit is available (in open access).



ROBOTRACK BASE KIT

1. Compliance with FSES pre-school education requirements (Federal state standard of pre-school education), FSES general education requirements (Federal state standard of general education).
2. Methodological, technical support of implementation of the robotic complex in the educational organization.
3. Annual development and updating of the educational software and logistics.
4. Price accessibility of new educational technologies and modern construction kits for organization of children's research activities.
5. Formation of engineering style of students' thinking.
6. Possibility to hold competitive events.
7. Formation, development and improvement of pedagogues' information competencies.
8. Effective investment of governmental funds.
9. Guarantee of the quality and accessibility of supplementary education for every child.



RESOURCE KIT “NEUROTRACK”

The «NEUROTRACK» kit contains neurohandband that takes the electroencephalographic (EEG) signal from the brain by two sensors that touch the forehead and the left ear lobe. Then it transfers data to the computer via wireless technology (Bluetooth). There are 3 types of signals that will allow you to control the robotic model: concentration, meditation and eye blinking. Neurohandband works with the Trackduino controller.

The kit contains at least 3 components:

1. 1 neurohandband;
2. micro-USB charge cable;
3. 1 CD with software and instructions.



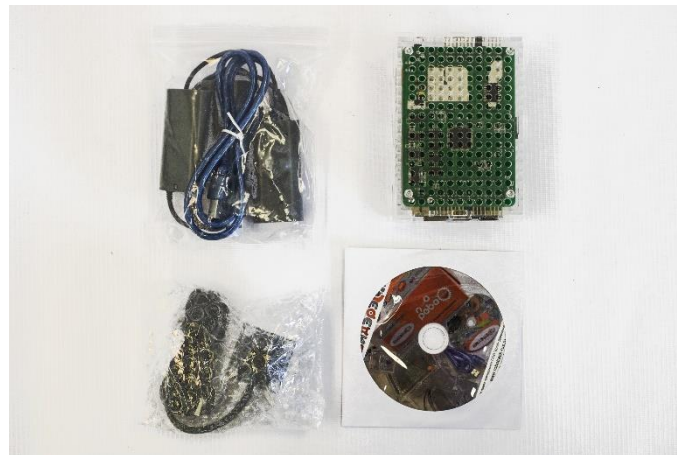
RESOURCE KIT “VIDERETRACK”

«Videretrack» recourse kit extends the capabilities of the Trackduino controller by adding the microcomputer with a special operating system. Brain Development Ltd. developed a unique Training course on the study of the technical vision! This educational-methodical complex includes 30 lessons. By using this kit you will:

- form skills for designing of complex component constructions, using modern technologies of monocular computer vision,
- form skills to work with the regime of QR codes, the recognition of the object like "face" and the detection of graphical primitives,
- develop of skills of guide line tracking and motion search;
- develop of basic competencies for the analysis of colors using the Vitrek controller, HD cameras and robotic applications.

The kit contains at least 5 components:

1. Vitrek microcomputer in the case
2. HD-video camera (720 pel resolution) in the case
3. CD with software and instructions.
4. USB cable
5. case for 9 V batteries



RESOURCE KIT "AUDIOTRACK"

Audiomodule "Audiotrack" is designed to enhance the capabilities of the controller "Trackduino". Allows you to play audio files in popular formats such as MP3, WAV and WMA. The module has a microSD card of 8 GB, so you can use it immediately after purchase. Built-in speaker with a power of 3W allows you to create fairly loud projects that will be heard in even in large auditoriums. The module is managed programmatically, it does not require additional power. With the help of libraries and graphic blocks included in the Robotrack IDE software, you can perform basic actions:

- play a specific file;
- play a specific file from the specified folder;
- pause the track;
- continue the track;
- play the next / previous track;
- increase / decrease the volume;
- set the volume as a percentage from 0 to 100.



Allows you to extend the capabilities of the construction toy sets

RESOURCE KIT “ENERGYTRACK”

The battery pack "EnergyTrack" is intended for power supply of "Trackduino" boards and microcomputer Vitrek. "Energytrack" allows to ensure long-term operation of boards at maximum load, supports simultaneous use of 4 DC motors, together with servo motors, display, Audiotrack and other sensors/performers. It will be useful for the development of large-scale projects using educational kits "Robotrack". The electrolyte is a polymer material (Li-Po), which has a low self-discharge, no memory effect and a higher energy density per unit mass, compared to conventional Li-ion batteries. The body has openings for connection to the mechanical blocks of the educational kit "Robotrack", a single connector for connecting the charger and power consumers, inside the case there is a protective substrate.

The kit includes:

- 1 Battery pack
- 1 Charger
- 2 connecting wires



RESOURCE KIT

Allows you to extend the capabilities of the construction toy sets

RESOURCE KIT “FASTENERS”

“Fasteners” kit allows to increase the strength of the robotics structures by creating rigid connections.

The kit contains at least 377 components:

1. plastic corners;
2. bolts (4 sizes), screw-nuts and shims;
3. set of pins (5 sizes) and installation device;
4. screwdriver and wrench.



RESOURCE KIT “SENSORS”

The main task of the sensors is to present information from the external environment to the controller.

The kit contains at least 25 components: LED modules (3 colours); accelerometer / gyroscope; 2 external encoders; fire sensor; sound sensor; touch sensor; tilt sensor; vibration sensor; magnetic field sensor; piezo-emitter; ultrasonic distance sensor; colour sensor + light sensor remote sensor; infrared sensor; loudspeaker.



RESOURCE KIT

Allows you to extend the capabilities of the construction toy sets

RESOURCE KIT “PLASTIC”

The kit extends the designing capabilities, allows to create various three-dimensional models.

The kit contains at least 511 components:

1. plastic beams of different shapes (5 types), blocks (at least 11 types) for object construction;
2. plastic corners, arcs, eyes;
3. engine fastening frames (3 types);
4. adapters (2 types);
5. 6 rubber plates.



RESOURCE KIT “METAL”

The metal elements of the kit allows to create strong and durable constructions and gears.

The kit contains at least 342 components:

1. 60 metal plates for object construction;
2. coupling beams (2 kinds);
3. bolts (4 sizes), screw-nuts and shims;
4. screwdriver and wrench;
5. aluminium arcs;
6. aluminium gear wheels.



RESOURCE KIT

Allows you to extend the capabilities of the construction toy sets

RESOURCE KIT “WHEELS AND CATERPILLARS”

The kit allows to expand the mobility, increase the cross-country capability of the robotic systems.

The kit contains at least 120 components:

1. wheels (8 types and sizes);
2. set of links for caterpillar.



RESOURCE KITS “SERVOMOTOR” AND “DC MOTOR”

Resource kit “DC MOTOR” is needed to increase the number of used engines in robotic models.

The kit contains 4 components:

1. DC motor;
2. set of frames.

Resource kit “SERVOMOTOR” helps to simulate the various movements of robots.

The kit contains 5 components:

1. servo motor;
2. set of servo horns (big and small);
3. set of frames.



RESOURCE KIT

Allows you to extend the capabilities of the construction toy sets

RESOURCE KIT “TRACKDUINO”

“Trackduino” kit provides a huge opportunity to create any robots, you can connect sensors, motors, displays.

The kit contains 3 components:

1. Controller Trackduino;
2. USB cable;
3. case for 9 V batteries.



RESOURCE KIT “SHAFTS AND GEARS”

Resource kit “Shafts and gears” allows to create swivel joints, complex fasteners, as well as gear-based mechanisms.

The kit contains at least 328 components:

1. plastic (4 types) and aluminium (5 types) shafts;
2. plastic, rubber and metal couplings;
3. plastic sleeves (2 types); gears (4 types), levers.



RESOURCE KIT

Allows you to extend the capabilities of the construction toy sets

RESOURCE KIT “COLOR TOUCHSCREEN TFT DISPLAY”

This kit comes in handy for displaying graphic information: text, images and simple drawings. The display has the 320x240 pel resolution, is controlled by UART and has a resistive touchscreen. With the help of libraries and graphic blocks included in the Robotrack software, you can perform basic actions: to draw some geometric figures, to display the text, to turn on the drawing mode on the touch-screen.

The kit contains 1 color touchscreen TFT display.



RESOURCE KIT “TEMPERATURE SENSOR”

The temperature sensor is useful for measuring the temperature of air, liquids and other objects in a wide temperature range (from -55 to +125 Celsius degrees) with an error of +/- 0,5 degree in the range from -10 to +125 degrees.

The kit contains 1 temperature sensor.



RESOURCE KIT

Allows you to extend the capabilities of the construction toy sets

RESOURCE KIT “WORM GEAR”

Helical gear is necessary for complex mechanical transmission creation and for increase of the lifting mechanisms power and the motion transferring at the angle of 90 degrees.

The kit contains 1 worm gear.

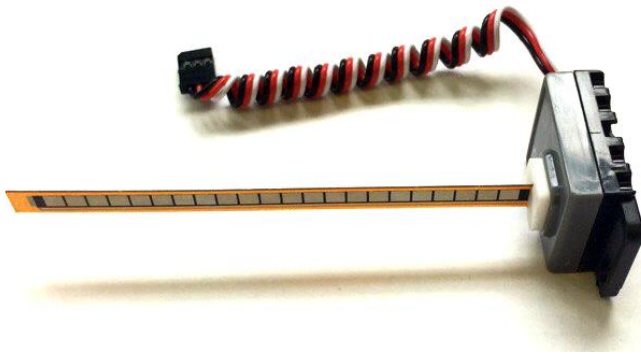


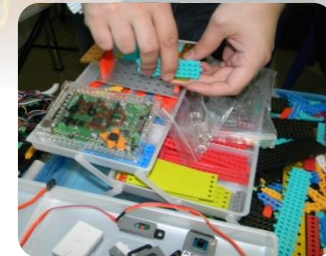
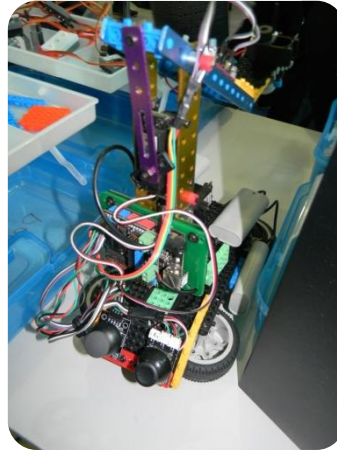
RESOURCE KIT “BENDING SENSOR”

Bend sensor can be used:

- for measuring of various angles and displacements;
- for obtaining information about the device physical condition and/or about device movement on the basis of various bends analysing.

The kit contains 1 bend sensor.





The developed construction kit ROBOTRACK ENGINEER makes it possible to engage in design activities and will be useful for students of colleges and universities; it meets the statutory standards of secondary vocational education and higher professional education in a number of technical specialties: Automation and Control, Computer Science and Computer Engineering, Mechanical Engineering, Education, Instrumentation, Chemical Engineering, Electronics and Microelectronics, Radio Engineering and Telecommunications, Electrical Engineering, Power Engineering, Natural Science. The controller can also be used to build robotic systems on its base.

ROBOTRACK CONSTRUCTION KIT FOR PROFESSIONAL EDUCATION

The ENGINEER kit includes not less than 2061 elements:

- 1) plastic connecting mounts of different shape (5 types), metal and plastic blocks (at least 9 types) for objects construction
- 2) wheels - 8 types
- 3) a screwdriver, a wrench, extension wires for sensors
- 4) gears - 4 types, levers and plastic angles, a set of chains for chain tracks
- 5) a kit of plastic (4 types) and metal (3 types) shafts, plastic plugs and plastic, rubber and metal couplings, iron bolts (five sizes), nuts, washers
- 6) a kit of flat plastic frames (3 types) and rubber adapters (2 types)
- 7) a kit of three-dimensional rectangular connecting mounts (2 types)
- 8) a kit of plastic pins of five sizes and a device for installation of pins
- 9) 1 motherboard for advanced level
- 10) a kit of various sensors (not less than 13 types), 3 types of LED modules, gyroscope
- 11) 2 DC motors and 1 servomotors (more powerful) for advanced level and 2 external encoders
- 12) USB cable for advanced-level board and a programmer for entry-level board
- 13) 1 battery case (9V)
- 14) 1 remote control panel
- 15) ROBOTRACK software, instructions, a minimum of 39 ready files for upgrading TRACKDUINO board with algorithms for robots programming in open access



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