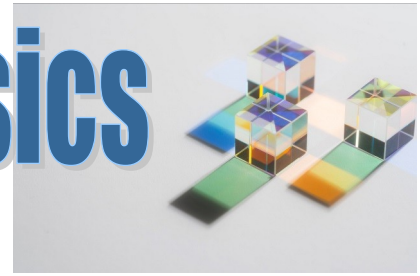


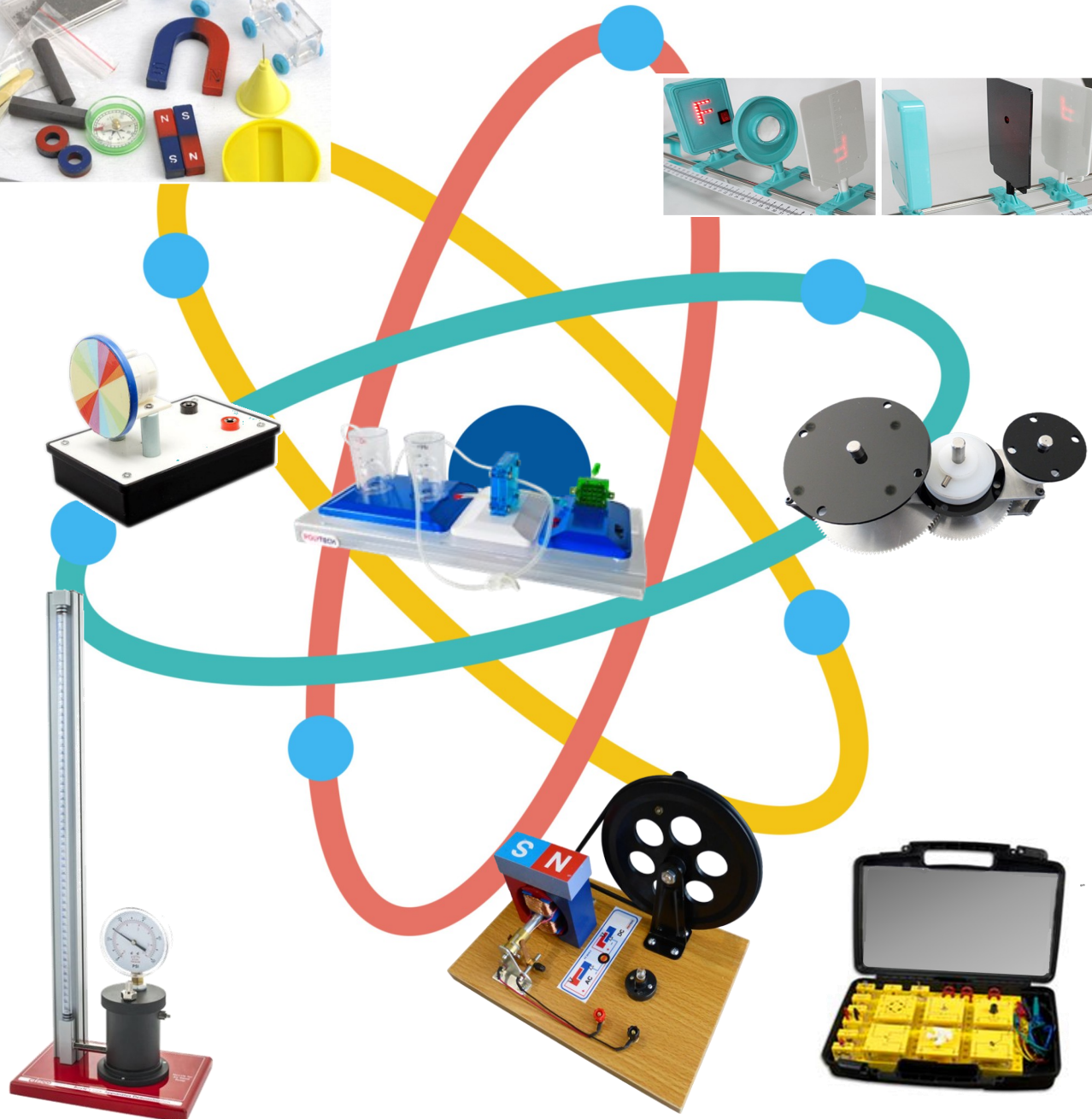
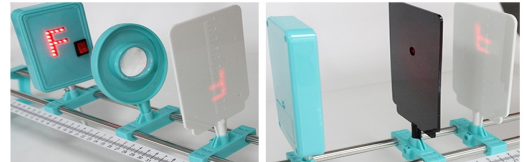
# P1 CATALOGUE

# Physics



## PHYSICS LABORATORY EQUIPMENT

The P1 catalogue includes equipment and devices that are used generally in Physics science laboratories.



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## PT 2130.M30 MAGNET KIT

Investigate the properties of magnets. Identify the North and South pole of the magnets. Identify the properties of the poles. Investigate the attraction and repulsion of poles. Discover the magnet in poles of different form.

Use a ferrous dust box to visualize the magnetic field. Built their own compass with floating method or use a pendulum base. Build a compass with the provided base and magnet. Experiments with magnetic levitation and magnetic cars.

**PT MG01** offers a set of 30 different types of magnets and compass which in conjunction with other equipment, emerge as a great aid to young students learning and comprehending the basic concepts of magnetism . It offers to the young students:

### QTY PT MG01 set

- 4 Bar Magnets - No color
- 4 N/S Colored bar magnets
- 6 Ring magnets
- 4 Ball magnets
- 2 Horse shoe magnets
- 4 Compasses assemblies
- 4 Hand compasses
- 1 Assembly for magnetic Levitation
- 1 Ferrus dust
- 2 Bar magnet wagons
- 1 Plastic case



## PT 2130.M12 METAL STRIPS

- Magnetic and non-magnetic sheet metal strips.
- Dimensions: Length: 40 mm, width: 10 mm
- 12 Metal strips of: Iron 3pcs, Nickel 2 pcs, Neodymium 2pcs, Aluminum 3pcs, Brass 2pcs.
- Each strip marked with a key letter for identification.



## PT 2010.4VR VACUUM PUMP

- Electric single stage, rotary vane vacuum pump.
- Air displacement capacity: 4,2 m<sup>3</sup>/h.
- Power supply: 230 V.
- It provides a top handle of carrying it.
- Accessories: oil change handling pan and 5 m rubber tube.



SPECIFICATIONS	
Operation	Electric Vacuum Pump
Type	Rotary vane /Single stage
Voltage	220V/50HZ
Free Air Displacement	2.5CFM- 4,2 m <sup>3</sup> /h
Power	0,25 HP
Ultimate Vacuum	2 PA/0.02 Mbar/15 Microns
Rotating Speed	1440
Oil Capacity	220ml
Dimension	260x110x240mm
Weight	7kg
Color	Grey /blue or Grey / black

## PT 2120.DC SET OF CUBES + CUBES FOR DENSITY DETERMINATION

- Set of 7 various material cubes
- for Density determination experiments
- 7 pieces Cube, 25\*25\*25 mm
- Copper, brass, lead, aluminum, iron, zinc, tin, acrylic, rubber, wood.



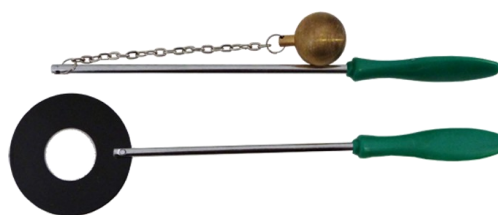
## PT2111.ND NEWTON'S COLOUR DISC

Newton disc 75 mm dia. mounted on the axle of a small motor, which is fitted on a plastic base. Plate with connection sockets. Operates on 4-6 Volts DC.



## PT2110.9 BALL AND RING

Device for studying the effects of thermal expansion and contraction. It consists of: a metal rod with a plastic handle (length 220 mm) at the end of which there is a brass bead (diameter 25 mm) hanging from metal chain 110 mm, a metal rod with a plastic handle (length 195 mm) at the end of which there is a ring with internal diameter 26 mm and outer diameter 60 mm.



## PT2110.9S THERMAL CONDUCTIVITY STAR

For demonstration of differences in the thermal conductivity of five different metals: brass, copper, nickel, aluminum and iron. A rod of each metal is radially spaced equally on a brass hub.





## PT2013.9F3x FRICTION RODS

Rods made of conductive materials to demonstrate experiments electrostatics. Cylindrical in shape.

Materials: **Ebonite, PVC, Glass/Brass**

**PT2013.9F3A** Diameter A: 12mm, length: 30 cm

**PT2013.9F3B** Diameter B: 10mm, length: 25 cm



## PT2113.7B KOLBE'S ELECTROSCOPE

- Instrument pointer for detecting electrical charge.
- Voltages with high sensitivity.
- Metal housing with 4mm sheath grounded, front and rear glass. needle, with pivot bearing, scale, suitable for shadow of.
- Includes Capacitor Plate in 4mm Plug.
- Measurement range: 0 - 1,5 KV.



## PT 2110.SB6 SPRING BALANCE SET

Dynamometers : 2 x 10 N, 2x 15N and 2x 20N).

Set of six tubular spring balance/scales with different measurement ranges for determining force and elasticity and exploring physics principles in forces and mass. Each scale has a ring at the top for hanging and an S-hook at the bottom for attaching the sample to be weighed. Clear plastic housing allows observation of the extension and retraction of the spring.



## PT 2113.RH2 RHEOSTAT

- A sliding rheostat /adjustable resistor. Slider on the top rail.
- Resistance: 100  $\Omega$
- Current: 1.8A
- With 4 mm sockets on both sides of top rail
- Length 210 mm



## PT2112.10 LIQUID LEVEL APPARATUS

Large size four communicating vessels apparatus designed to demonstrate the laws of Pascal. The tube containers are equal height of approximately 200mm made of glass with different shapes and volumetric capacity and communicate with common bottom glass tube. The apparatus is mounted on a demonstration plane with base in a way that it is visible from both sides of the demonstration plane. With triangular bottom stands. Apparatus size 230 mm x 330 mm.



## PT 2112.11 OUTFLOW VESSEL

Outflow vessel  
Plastic cylinder with three outlets at different heights  
Discharge outlets with plugs  
Cylinder height: 300mm



## PT2112.14 VESSEL WITH OVERFLOW

Cylindrical plastic vessel  
Height:145mm  
Diameter: 75mm  
Volume approx.: 250 ml  
Overflow tube  $\Phi$  6 mm



## PT 2112.13B FLUID PRESSURE APPARATUS

Demonstrates the phenomenon of transmissibility of fluid pressure. For the same force exerted, pressure is inversely proportional to the surface area. The apparatus comprises of the 2 glass syringes of different diameters. On the top of each syringe piston there is circular disk for loading masses (masses are not included).

The glass cylinders are connected by a flexible tube (4mm in diameter and 30mm in length). Pistons allow for changes in pressure by positioning of various weights on the discs on the top of the pistons. The syringes are fitted on a horizontal rod with 2 housings. The rod can be connected to a rod stand axis.

Pressure range from 0,6Mpa to 1Mpa.  
Syringe1 100 ml, Syringe 20ml.



**PT2112.30 BAROMETER**

**Barometer**

Diameter: 92mm.

Measure Range: 940~1050 hpa (mbar) or 28~31 in/Hg.



**PT 2112.31 MANOMETER**

Manometer for measuring pressures in the range 0 to 10 hPa (cm water column). It consists of a U-tube open on both sides with overflow basin on aluminum base plate with scale. Includes stand rod on the reverse for attaching to stand base.

- Height of tubes : 250 mm
- Base plate: 310 × 40 mm approx.



**PT 2113.30 RADIOMETER**

Device for demonstrating the conversion of radiation energy into kinetic energy.

The radiometer is made from a glass bulb from which much of the air has been removed to form a partial vacuum. Inside the bulb, on a low friction spindle, is a rotor with several (usually four) vertical lightweight metal vanes spaced equally around the axis. The vanes are polished or white on one side and black on the other. When exposed to sunlight, artificial light, or infrared radiation (even the heat of a hand nearby can be enough), the vanes turn with no apparent motive power, the dark sides retreating from the radiation source and the light sides advancing. Just place near a window or under a direct incandescent light as the vanes only rotates in light (sunlight or incandescent light). The more light shine on the globe the faster the vanes rotates.

Height: approx. 210 mm

Ball diameter: approx. 80 mm



**PCB 2113.31 BOHR ATOMIC MODEL**

Bohr's Atom model constructor.

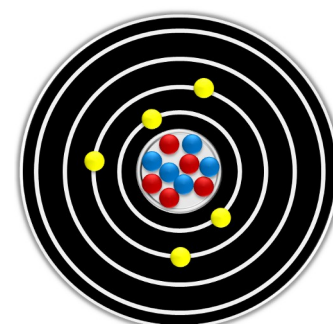
4 orbits, on each side. Center nucleus cavity.

Magnetic holding of elements.

2 atoms ( nucleus), 30 protons, 30 neutrons and 30 electrons.

Create isotopes construction by adding neutrons to the atomic nucleus;

Create dual atom and have valence electron motion.





## PT2014.9 PLANE MIRROR

Unmounted Plane Glass Mirrors - 100mm x 100mm

- Silvered back with protective coating.
- Dimensions: 100mm x 100mm
- Thickness: 2mm

Pack of 10



## PT2114.8G5 CONVEX MIRROR

Convex mirror, diameter 50mm, glass with a focal length of 150mm optically worked, silvered back with protective coating.

Set of 5 pcs



## PT2114.7G5 CONCAVE MIRROR

Concave mirror, diameter 50mm, glass with a focal length of 150mm optically worked, silvered back with protective coating.

Set of 5 pcs



## PT2112.34 HELICAL SPRING

Coil spring for demonstration of the propagation and reflection of longitudinal waves

Extended length: 5 m

Coil diameter: 70 mm



## PTX 2112.41 GALILEO'S THERMOMETER

- Material: High borosilicate glass, paraffin oil
- Temperature range: 6 color balls, gold tag, 18-26°C
- Glass body with six glass measuring spheres
- Range: 18 to 24 °C
- Accuracy: 1 °C
- Height approx.: 40 cm

Galileo thermometer is based on the principle of object density with temperature changes designed color glass globe thermometer. Measures range of 16-28 degree centigrade shown on the tags hung on float globe.

Size: 4.7 x 7.5 x 37 cm



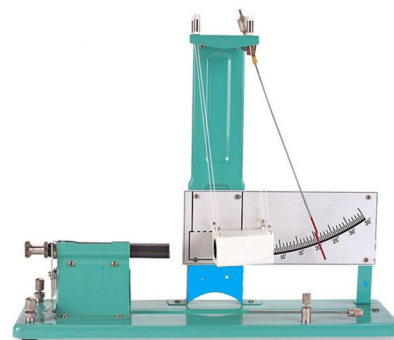
## PT 2111.BP BALLISTIC PENDULUM

Apparatus to demonstrate the laws of conservation of momentum and trajectory.

The unit has a scale marked in degrees to show height and is registered by a counter weighted needle that remains in place at the height of the pendulum archived.

### Features

- Tabletop or table mounting
- Launcher with 3 selectable speeds
- Launch angle: 0° – 90°
- Scale division: 1 degree
- Trajectory range: 3 m
- Two projectile balls



## PT RE 265 SOLAR CELL

Single photovoltaic cell 5.5 W with Voltage Regulator, DC to DC Step Up/Down current, Converter integrated.

The panel is connected to an adjustable Voltage Regulator with Input from the solar panel giving Output voltage from 0.5V DC and Output current: up to 5 A. The regulator LCD displays the V and I values. It offers a switch between Input and Output values and regulation trimmers. Output terminals of the regulator are 4mm safety terminals where loads can be connected.

### Specifications

Photovoltaic Panel	
Maximum Power	5.5W
STC capacity	AM 1.5 ,25°,1000W/m²
Voltage output	5 Volts
Dimension	27 x 18.5cm
Voltage regulator	
Output Voltage	0,5 Volts to 5 Volts regulated
Output Current	0.5 Amps to 5 Amps regulated
LCD	Selectable Input V,I or Output V,I

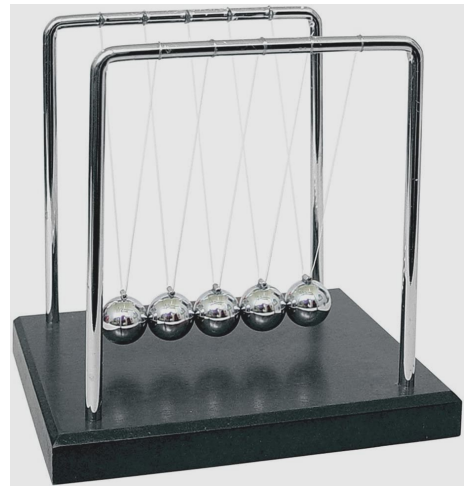


## PT 2110.NP NEWTON'S CRADLE

Newton's cradle is a device that demonstrates conservation of momentum and energy via a series of swinging spheres. When one on the end is lifted and released, the resulting force travels through the line and pushes the last one upward.

The Newton's cradle consists of five identically sized metal balls suspended in a metal frame so that they are just touching each other at rest. Each ball is attached to the frame by two wires of equal length angled away from each other. This restricts the pendulums' movements to the same plane.

Dimensions: 100 x100 x 80 mm



## PT 2113.SM12 ROD MAGNETS–NEODYMIUM

Sintered Neodymium Iron Boron magnet, 25mm length, is the third generation of permanent magnet and it offers the strongest magnetic power today. It is widely used in motor, sensor, elevator, automotive, wind generator, speaker, military and aerospace industries etc. Neodymium magnet has poor resistance to corrosion.

Radius: 5 mm



## PT 2113.EFM FLOATING MAGNET

### Function and Applications

The device shows in a very demonstrative way the forces acting between two magnets.

### Equipment and technical data

- 2 ring shaped magnets pushed over a rod with base, the poles with the same names face each other.
- Coloured pole identification.
- The magnets can be removed from the rod



## PT 2113.8 COMPASSES SET

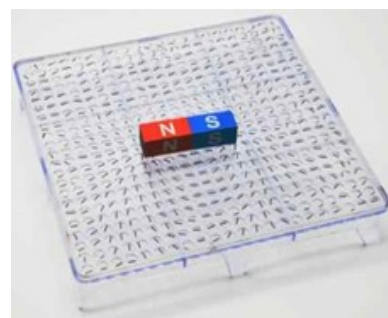
Compass, 35mm in diameter.  
Transparent housing  
Set of 4 pieces



**PT 2113.MFA MAGNETIC FIELD LINES SET**

Magnetic induction board demonstration board junior high school physics teaching experimental equipment electromagnetics.

- 1 transparent field line plate, dimensions: 20 x 20 cm
- 2 pcs bar magnets (one large and one small)
- 1 horseshoe magnet
- Iron dust



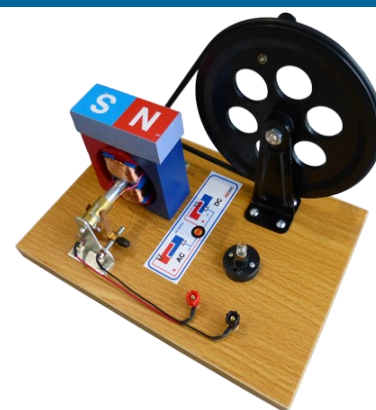
**PT 2113.MFC CONDUCTOR IN A MAGNETIC FIELD**

The apparatus is comprised of a strong U-shaped magnet, a pair of brass rails with 4 mm socket terminals, a pair of columns that hold a coil. A brass axle is free to roll along the rails and completes the electrical contact between them. When the axle is placed on the rails between the poles of the magnet and power supply unit is connected, the axle is repelled and rolls along the rails away from the center of magnetic field. Dimensions of the base: 40 x 100 x 60 mm. It comes with power 6 volt DC power pack and cables.



**PT2010.2 AC/DC HAND GENERATOR WITH CRANK**

AC / DC generator and motor model designed for the study of AC and DC generation and DC motors . It consists of a wooden base (dimensions 200x300x15mm) with rubber supports under it and electrical wire connections to the 24mm terminals on the top and to the light bulb base under it. On the base there are is a magnet assembly with top magnet, removable magnet polls can be interchanged, inside the magnet structure there is a rotating coil firmly fixed to the rotation axis. The crank handle is fitted onto a wheel (diameter 170mm) which is connected with the rotation axis of the coil using a rubber belt (diameter 170mm) for crank rotation. The rotation axis of the coil includes a motor slip ring with 2 sliding contactors connected to the 4mm terminals. Depending on the configuration of connection, on the contactors, on the slip ring, AC or DC power generation is achieved. The generator enable measurement of the resulting electricity and connection with various electrical circuits. The 3V E10 lamp is connected directly. A scheme is provided for the wiring of each experiment ( AC & DC generator ,DC motor. The rotating gera of the generator motor is covered by a transparent acrylic cover. It is also operated as DC motor when supplied with voltage from the provided power supply (6 VDC). Two cables wit4mm leads are provided.



**Output Power:** 3 –4 W  
**Voc** NO load , up to 12 V  
**Current:** 0.1—0,8 A

**PT 2010.2 B DC HAND GENERATOR/MOTOR WITH CRANK**

A low power , small size alternative . only DC generator and motor model designed for the study of DC generators and motors for junior students. Made of transparent ABS plastic material.

**No-Load Output Voltage: 6.3V**

**Output Current: 03A**

Storage Method: Well-ventilated, dry, indoor temperature preservation

Small Light bulb and power 6 VDC power pack included.

Weight: 178g(approx.)

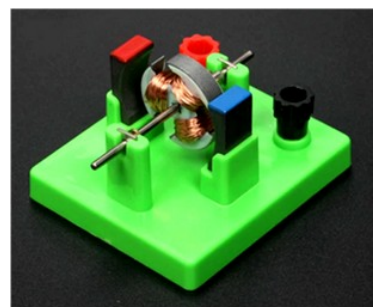


**Output Power:** 1,8 W  
**Voc** NO load , 6,3 V  
**Current:** max 0.3 A

## PT 2113.EM ELECTRIC MOTOR

Dc motor model

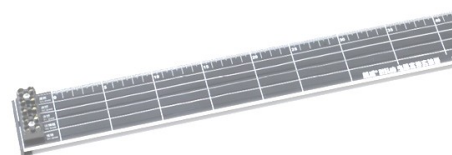
- Direct-current 3V
- Simple model of an electro motor with double T rotor
- U shape core
- Coils
- Power supply sockets
- Connection cables and bar magnet
- All parts visible
- Power supply



## PT 2113.RX10 RESISTANCE APPARATUS

Science Education Resistance Law Apparatus for Physics.

- Application: Physics Experiment
- Study: Resistance Law, Investigation of dependency of electrical resistance on conductor length, Conductor cross-section and material
- Sensor Combined: Current Sensor.
- Base with six wires laid side by side with 4 mm sockets on both ends.
- Different diameters of wires up to 1 mm.
- Material: constantan, brass, etc.
- Wires length: 1000 mm



## PT2012.6B THERMAL CONDUCTIVITY BARS

Set for experimentation in Thermal conductivity and Heat transfer in metals.

The set consists of 4 same length and thickness metal strips, 1 copper, 1 brass, 1 aluminum and 1 iron.

The strips are stored in a plastic pocket enclosure

Length 100 mm



## PT 2112.6S BIMETAL STRIP

Riveted sheet iron and non-ferrous sheet metal together.

Length: 150 mm

With wooden handle



## PT2013.10 SAFETY CROCODILE CLIPS

Alligator type cables, 4mm length.

Pack of 12 pcs.





### PT 2112.33 CONVECTION CHAMBER

Material: transparent acrylic chamber  
 Includes: 2 chimneys on metal base plate  
 Science Topic: Convection processes in air  
 How to use: Place a small, lit candle under one open chimney, then use touch paper or a wood splint to introduce smoke into the opposite chimney.



### PT2112.34 CONVECTION IN LIQUIDS

Glass tube in rectangular loop shape with filling pipe for demonstrating heat flow in a non - uniformly heated liquid.  
 Tube diameter: 25 mm  
 Dimensions: 350 × 250 mm



### PT2012.11 CALORIMETER

Apparatus for studying thermal effects. It consists of: 2 concentric cylindrical vessels (diameter 60mm and 100mm respectively) which are thermally isolated with suitable material, a transparent acrylic cover (diameter 100mm) with 3 circular slots where a heating coil (resistive 1 5Ω) with terminal connections are placed. The terminals and the coil have a protective coating which prevents the effects of electrolysis. The device is equipped with an insulating handle, stirrer and a rubber bung with hole. The calorimeter should be equipped with a two-piece heating element, connected with 12 VAC voltage or DC current of 2.5 A.



**PT 2012.11S4** : Buddle Set of 4

**PT 2012.11S8** : Buddle Set of 8

### PT 2112.20A5 STEEL BALLS

Diameter: 30 mm  
 Pack of 5 balls



### PT 2112.36 JOLLY' BULB AND GAUGE

This Jolly bulb apparatus consists of a 60mm diameter bulb directly connected to a bourdon pressure gauge. The apparatus is used for investigation of gas at a constant volume. By inserting the glass bulb into either warm or cold water, the expansion or contraction of the air contained in the bulb can be seen as a pressure change on the gauge. Manometer: 840 – 1240 hpa.



### PT2112.37 BOYLE'S LAW APPARATUS

- Boyle's law apparatus with pressure gauge based on an acrylic base.
- Demonstration of ratio of volume to pressure at constant temperature.
- Graduated cylinder with piston acts on a manometer.
- Cylinder length: 300 mm
- Gauge diameter: 100 mm

The experiment verifies Boyle's Law for ideal gases at room temperature, taking air as an ideal gas in this experiment. The volume of a cylindrical vessel is varied by the movement of a piston, while simultaneously measuring the pressure of the enclosed air.



### PT2112.38 PLASTIC MAGDEBURG HEMISPHERES

A demonstration apparatus which consists of 2 plastic hemispheres with an effective O-ring seal and plastic valve. When evacuated, a force in excess of a limit is required to separate them. Can be evacuated with a Hand Operated Pump or a plastic syringe.

Material: ABS

Size: about 20\*5 cm

Diameter: 10 cm

Black or red color plastic



### PT 2113.PB PLASMA BALL

Induction ball lamp for children, electrostatic magic ball for physics experiment.

Plasma light with over current physiological response.

Diameter approx.: 130 mm



## PT2013.1 TRANSFORMER

### Features

- Both primary coil and secondary coil has safety cover
- Primary circuit has standard power socket, fuse and switch
- Secondary circuit has 4mm safety socket and double insulation
- Step up or step down performance

### U/I shape stacking silicone core

#### CORE 1C

##### Features:

- Dimensions: H200mm, L120mm, 40x50 section
- Weight: 6kg



#### PRIMARY COIL 1P4

##### Features:

- Power supply: 220V
- 440T, max I: 4A
- Power socket, fuse, switch
- Dimensions: 110x90x100mm
- Weight: 0.85kg



#### SECONDARY COIL SV

##### Features:

- Consisting of 5 windings in series
- 6T, 12T, 24T, 48T, 96T
- Max I: 25A, 13A, 6.6A, 3.3A
- 4mm safety socket output
- Double insulation
- Dimensions: 110x90x100mm
- Weight: 0.85kg



## PT2013.VG1 VAN DE GRAAFF GENERATOR

The Van de Graaff generator is used for absorbing plenty of electric charge and high voltage (more than ten thousand volts) in the experiments of electrostatics. Without other devices, it also can be applied for a series of experiments, such as electrostatic induction, spark discharge, point discharge, capacitance change of capacitors (referring to Leyden jar on the generator), etc. with the maximum voltage not less the 180 KV, and discharge distance not less than 100mm.

### Specifications

- Spark length approx.: 10 cm
- Output voltage: 150 kV
- Short-circuit current: < 10  $\mu$ A
- Motor operating voltage: 230 V
- Spheres diameter: 200 and 70 mm
- Connection 4 mm sockets
- Accessories including whirl, belts and leads.
- Manual / electric drive.
- Large size electrode ball.



## PT 2110.WT RIPPLE TANK

This device demonstrates the generation, propagation, reflection, interference and diffraction of waves. Comes with all accessories necessary for these experiments.

### Specifications

- Stroboscope lighting: LED
- Dimensions of tank structure: 300 x 300 x 300
- Dimensions of projection screen: 300 x 300 mm
- Ripple generator with power adapter
- Frequency: 0-50 Hz
- Set of accessories including dippers, lenses, hoses, etc.



## PT 2014.01 LIGHT BOX AND OPTICAL SET

Optics set experiments demonstrating the properties of light such as reflection, refraction of light and color spectrum.

The set consists of a set of 30 items offering a wide range of experimentation in Optics.



### Includes the following:

- 1x Prism Degrees 45/45/90
- 1x Prism Degrees 60/30/90
- 1x Prism Degrees 60/60/60
- 1x Prism Semi-circular block
- 1x Prism Rectangular block
- 1x Prism Dual concave lens
- 1x Prism Dual convex lens
- 1x Plane mirror
- 1x Wooden projector block
- 1 x Semi-circular mirror ( concave & convex)
- 1 x Parabolic mirror ( concave & convex)
- 1 x Light box
- 1 x Light bulb( halogen) with power cable
- 2 x flat mirrors
- 2 x slits for the light source
- 8 x Color filters
- 1 x LED source
- 1 x slide frame
- 1 x protractor- ray map plasticized paper
- 1 x eye -retina chart plasticized paper
- 1 x 10mm shape image for projection



## PT 2113. HB2 HELMHOLTZ COILS

Number of turns:	320 each
Max. field:	4.5 mT
Coil diameter:	136 mm
Rating current:	1.5 A
Effective resistance:	11 $\Omega$
Terminals:	4mm safety sockets
Weight:	1 kg

### Tube Holder

Dimension:	260 x 180 x 290 mm
Weight:	1kg



## PS 2333 VDC ANALOG VOLTMETER

- Display Type: Analog, 0-Adjuster on the front panel
- Measuring Range: 0~3V; 0~30V; 0~300V.
- Divisions: 0.1 V, 1 V
- Accuracy Class:  $\pm 3.33\%$  f.s
- Operating Temperature: Room Temperature
- Dimensions: 133 x 97 x 100 mm
- Display: Scale width 80mm
- Adjustment: Zero adjustment
- 4mm safety sockets



## PS 2333A DC ANALOG AMMETER

- Measuring Range: 0~0.050A / 0.5 A / 5A
- Divisions: 1 mA, 10 mA, 0,1 A
- Supply Voltage: 75mV
- Operating Temperature: room temperature
- Dimensions: 138\*100\*97 mm
- Scale width 80mm
- Display Type: Analog ,
- Accuracy Class:  $\pm 2.5\%$  f.s
- 4mm safety sockets



## PS 2333G GALVANOMETER

300  $\mu$ A DC sensitive Analog Galvanometer for physics.

- Measurement ranges:  $\pm 35 \mu$ A
- Scale division: 1  $\mu$ A
- 4-mm safety sockets





## PT 2110 AX1 ARCHIMEDES TEST SET

Set for experimenting with Archimedes Principle and density measurements.

### Set contains:

- 2 x Submerged objects, cylinder - shaped one metal solid and one Teflon. Both having diameters 2 cm , length 6 cm, with hooks.
- 1 x tall PP beaker with spout 250ml capacity, height 29 cm with hexagonal base.
- 1 x 5 Newton dynamometer.
- 1 x Retort stand set with metal base, vertical rod 600 mm, retort stand jack-boss and horizontal rod 200 mm with suspension hook.
- 1 x 150 ml Vernier type plastic caliper.

**PT 3071 AX6** - The above set with 6 PP Beakers.

**PT 3071 AX10** - The above set with 10 PP Beakers.



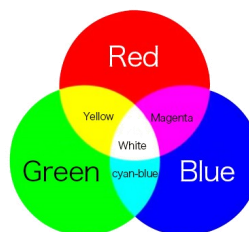
### PT 3071 LJ LABORATORY JACK

- Laboratory lifting mini Jack
- Metal platform 100 x 100 mm
- Lifting stroke 44-150 mm
- Max lift weight 2,9 kg



## PT 2114AC DEVICE FOR ADDITIVE COLOUR MIXING

Device for color mixing of the 3 primary colors  
The red, green and blue primary colors can be shown separately in a mix of any 2 and in mix of three.  
Light source is colored LEDs  
Batteries included.  
It has a power On Off switch for each led in the back  
Size: approx. 12x 8 x 4 cm.



## PT 2011.20TFS TUNING FORK - SET

A set of 4 pcs Tuning Forks, Chrome Plated.  
The frequencies are marked on each one.  
Mountable on a wooden resonance box with rubber stops on the bottom side.  
Size 33 x 12 x 7,5 cm.  
With a striking hammer.  
This set is primarily used for classroom training in sound waves and resonance experiments.  
Note / F ( Hz ) : C / 256 , E /320 , G/384 , C /512 .

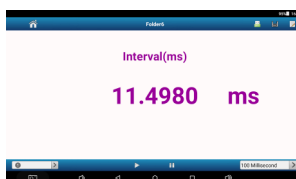


## PTS 2110.TAF FREE FALL APPARATUS

An apparatus to measure acceleration of gravity  $g$  by measuring the drop distance and the fall time. The apparatus consists of a release mechanism that co-acts with the start photogate switch-1, a photogate that acts as the end switch-2 and the falling objects. The startup mechanism works for conductive objects i.e. iron ball.

### Includes:

- 1 Vertical Aluminum Column 1,3
- 1 Meter graduated with 1 mm scale attached to its side
- 1 Free fall sphere
- 1 Ball receiver in the bottom
- 4 L shape clamps for attaching the photo gates on the column
- Electromagnetic holder of the falling ball with 4m terminal, switch and cables.
- 2 Photo-gates
- 1 DL 100 data-logger



- ⇒ Time logging: 5 digits, Scale: 1 ms.
- ⇒ Measuring range: 0.000sec ~ 9.999 sec.
- ⇒ Stores the time data in the memory.
- ⇒ Graphs the Velocity and the Acceleration using the time data and the formulas for acceleration and velocity to verify the theoretical model.
- ⇒ Stores the experiment and replays it at anytime (with multiple graphs Velocity and Acceleration vs time).
- ⇒ Complete with the iLab software for data recording analysis, interpolation and printing, all inclusive.
- ⇒ All necessary accessories, cables and Instructions for installation and operation.



## PT 2110 PCT PULLEY WITH TABLE CLAMP

Pulley for altering the direction of forces. Plastic pulley with ball bearings and cord groove plus securing clamp. Also has a bore so that it can be attached to a retort stand of up to 12.5 mm diameter

Pulley: 50 mm dia.

Span of bracket: up to 35 mm span



## PT 2113 MDC2 MAGNETIZING AND DEMAGNETIZING COIL

- Low voltage, suitable for magnetizing and demagnetizing ordinary magnets, iron bars, strips etc.
- Comprises of a solenoid wound with insulated copper wire and mounted on a base, complete with switch and 4mm terminals.
- Solenoid-250mm long x 35mm internal diameter
- Operating Voltage: 12V AC or DC at 6A
- Magnetizing by AC or DC
- Demagnetizing by AC only
- Power supply



## PT 2110 RPV VARIABLE PENDULUM

A mass, considered as of point form, suspended on a rod and subjected to the force of gravity, is deflected from its position of rest. The period of the oscillation thus produced is measured as a function of the pendulum length  $L$  and the angle of deflection.

### Includes:

- 1 Variable length pendulum apparatus
- Total length of swing rod 330 mm,
- With retort stand and disc protractor
- 1 stopwatch
- 5 slot masses 100gr each

The system can also work with a photogate and the DL 120 data logger for more accurate results on timing the period of the pendulum.



## PT 2140 FLG LIGHT GUIDE

Soft optic fiber bar is a transparent light guide material. It neither emits light by itself nor needs to connect with electricity.

It is a LED transmitter which uses a **LED light apparatus** to give light from one end.

**Length approx.: 20 cm**

Lighting Color - any one choice from:

Blue/Green/Red/Yellow/Warm white/Cool white

Color temperature & Wave lengths:

- **Red : 620-630nm standard**
- Blue : 460-470nm
- Green: 520-530nm
- Yellow: 590-595nm
- Pink:2000-2200K
- Cool white :6000-6500K



## PT 2130.ELS EXPERIMENT BOX SET – ELECTROSTATICS

This set consists of various individual instruments and a Wimshurst Machine described hereinafter. It is a detailed set of Electrostatic experimental devices which aims to demonstrate an extensive investigation of the Electrostatics principles and phenomena in the following topics:

- Electrostatic charging
- Forces on uncharged particles
- Charge indicator
- Forces between charged bodies
- Build your own electroscope
- Electroscope
- “Shock of hair”
- “Charge pendulum”
- “Spinner”
- “Electric ball dance”
- “Chiming bells”
- Demonstrating charge on a capacitor
- Charging due to induction
- Transfer of charge using a “charge spoon”
- Faraday’s cup
- Faraday’s cage
- Plate capacitor

### Wimshurst Electrical Machine

The operating principle of the machine is based on two counter-rotating disks made of insulating material. Each disk has several metal segments attached to it, called sectors. As the sectors pass one another, they induce a charge imbalance on one another. This imbalance is drained off at the collecting electrodes.

Disk diameter: 33 cm

Size (Length x Width x Height): 28.5 x 20 x 33 cm

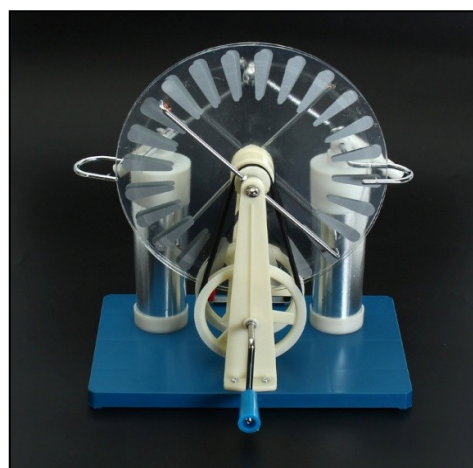
The whole set comes with instructions manual in a box, available in English or any other language requested..

Size of box:53x28x25cm



### Contents:

- Pointer Electroscope - 1 Piece
- Gold-Leaf Electroscope - 1 Piece
- Faraday Cage - 1 Piece
- Bell- 2 piece
- Acrylic Rod - 1 Piece
- Polythene Rod - 2 Pieces
- Nylon Cloth - 1 Piece
- Silk Cloth - 1 Piece
- Aluminum Discs - 1 Set
- Silk Braid Electroscope - 2 Pieces
- Separable Cylinder Conductor - 2 Pieces
- Semi-Sphere Conductor - 1 Piece
- Cone Conductor - 1 Piece
- Silk Braid Electroscope Stand - 2 Pieces
- Conductor Holder - 3 Pieces
- Tripod Stand - 3 Pieces
- Conducting Needle - 1 Piece
- Spin Electroscope with Stand - 1 Set
- Proof Ball - 1 Piece
- Insulating Handle - 2 Pieces
- Acrylic Sheet - 1 Piece
- Foam balls



## PT 100G EXPERIMENT BOX RENEWABLE ENERGIES

Renewable Sources of energy are provided to us inexhaustibly by nature. This laboratory explores the operating principles of **Solar, Wind, Hydropower** and **Hydrogen Fuel energy**.

The PT 100GE is a trainer on **Renewable Energy Sources** and includes practical training devices and build in instruments which enable the students to carry out a wide range of experiments in the area of Solar, Wind, Hydropower and Hydrogen Fuel Cell applications. The aim is to implement a complete program of experiences which enable students to learn the main characteristics of these 4 types of Renewable Energy. Also, to practice on processes and methods such as solar radiation to photovoltaic conversion process, wind power and factors of performance, electrolysis and Hydrogen fuel cell, Renewable methods of energy usage, power and coefficient measurements for each case, while doing real practical experiments.

All equipment is safely carried in a case along with an instruction manual in English and any other requested language.

### TRAINER

The console of the trainer includes:

- All connecting terminals for the input devices and output power measurements.
- Measuring voltages and currents.
- A variable load 0-100 Ohm, 0-450 Ohm motor.
- A 2 LED module for power indication.
- A motor with couplings to drive the wind generator (if no fan is used) and a variable speed to simulate wind speed.
- 1 Fuel cell base
- 1 PEM Fuel cell
- 1 Electrolyzer base
- 1 PEM Electrolyzer
- 1 Motor Fan
- 2 Gas container
- 1 H<sub>2</sub> & O<sub>2</sub> tank set
- 2 Rubber tubes
- 1 set Adaptors, clincher & valve
- 1 set Screws and post secure pin
- 1 5-Watt Solar panel
- 1 1-Watt Solar panel
- 1set 6 Cover filters of solar cells
- 1 Light source
- 1 Wind turbine Support base
- 1 Wind turbine mount axes
- 1 Wind turbine - Generator
- 1set Wind turbine blades
- 1 Electric Motor

### ACCESORIES

- 12 Terminal cables
- 1 Terminal Box
- 1 Battery pack
- 1 Voltmeter
- 1 Galvanometer
- 1 Ammeter



### ACCESSORIES

**Light source** for solar cells with halogen lamp min 100W (if it is not used with sunlight directly).

**Three speed domestic air fan.** This can be used to create air stream for the wind generator. Without this appliance the user can rotate the wind generator using the motor driver. **The trainer offers a scale of motor RPM's /air speed to facilitate wind simulation.**



## PS 2330.1A EXPERIMENT BOX SET – ELECTRICITY

The Electricity kit PS 2330.1 A is a basic electricity experimental kit for junior students. By using it they understand basic electrical components, circuits and their basic operations. They conduct Electricity experiments and understand the basic principles of electricity while it helps the children to learn, think and explore electricity basic circuit concepts.

### Features

The Electricity A experiments kit includes everything that you need to get started, provides a hands-on opportunity for students to build simple electrical models. Provides more than 30 experiments.

This electricity experiment kit can provide to the student the capability to build projects around theoretical topics and practice on element and circuit concepts, as:

- Battery – Power source
  - Voltage
  - Current
  - Insulators and conductors
  - Resistors
  - Serial circuits
  - Parallel circuits
  - Ohm's law
  - Motor operation – electromagnetism
- Lights and buzzers selection and control and a variety of basic electrical projects while understanding the wiring process of these basic components. All the provided components are stored in a plastic box.

### Components

The Electricity A elements provided are in a set of:

#### Parts

1. 10x Cell holder, 4.5 V – 10 pieces
2. 10x Bulb holders, E10, 12V – 10 pieces
3. 10x Push/knife switch, 12V, 5A – 10 pieces
4. 10x Resistors, 6 different, unknown, 6V - 10 pieces
5. 10x Mounted Motor, 6V – 10 pieces
6. 10x Clips, 12V, 2A – 10 pieces
7. 10x Mounted buzzer, 12V - 5 pieces
8. 10x Clips, 12V, 2A – 10 pieces

#### Accessories:

- 40 pairs of black and red, 4 mm leads, 75 cm length
- 100 x Light Bulbs, E10 12 V
- Carrying plastic box with plug in board
- Instruction manual in English and Turkish language.



## PS 2330.1B ELECTRICITY SET- ANALOG

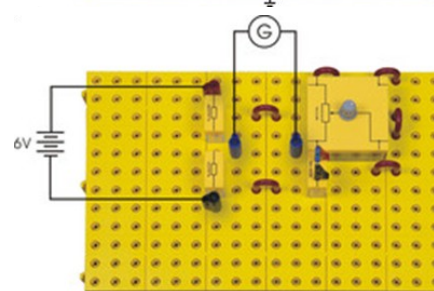
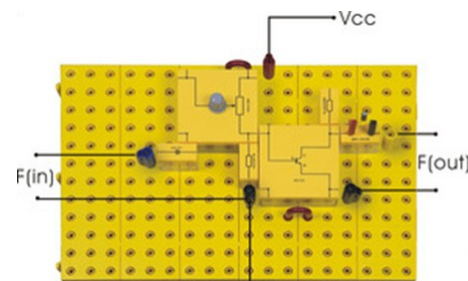
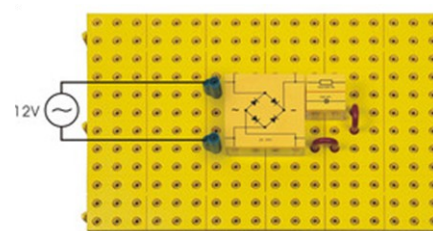
**The PS2330.1B trainer provides a case with plug-in base board where students can plug components or IC modules which are integrated in acrylic boxes with terminals.**

This trainer can offer different levels of electronics experiments. The PS 2330.1B configuration is focusing on the basic electrical components and circuits as the performance and characteristics of conductors and Insulators, Voltage and Currents measurements, Voltmeter and Ampere meter, batteries, switches, resistors and rheostats, capacitors, Ohm's law, serial circuits, parallel circuits, Kirchhoff's law for circuits, power measurement, Electricity to Thermal energy - Joules law, Power Watts and Wh.

The trainer also provides a DC Voltage supply module, DC Ampere meter module, DC Voltage meter module.

The trainer offers more than 15 basic experiments for the above topics plus variations of those experiments/It comes with an experiment manual in English and any other language requested.

The case includes the plug-in board, the plug modules and the accessory cables.



Plug in Modules	Qty
Resistor 680Ω,1/2W,1%	1
Resistor 1kΩ,1/2W,1%	1
Capacitor 1uF,25V	1
Potentiometer 10kΩ,0.5W	1
Diode ZD6.2V	1
LED	1
Thermistor	1
Push-button switch single	1
Toggle switch single	1
DC Fan motor 6V	1
DC Volt meter module	1
DC Amp meter module	1
DC Power supply module	1
Leads, 3 color	12

## PS 2330.2B ELECTRICITY B SET

The PS 2330.2B trainer provides a case with plug-in base board where students can plug components or IC modules which are integrated in acrylic boxes with terminals.

This trainer can offer advanced electronics experiments focusing in the performance operation and combined circuits of resistors, capacitors, diodes and LEDs, switches, transistors, LDR photo resistors, NTC and PTC Thermistors, Bridges, rectifiers and filters, amplifiers.

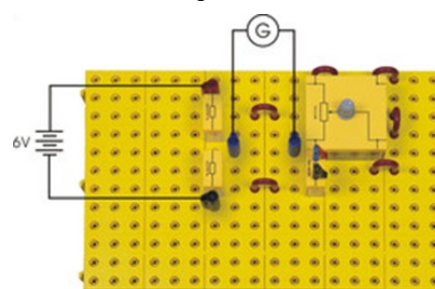
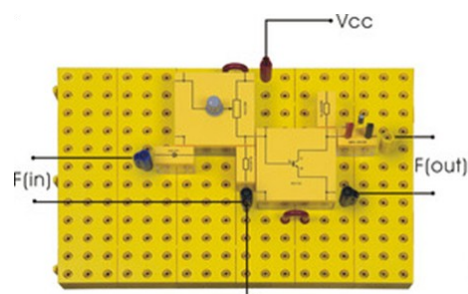
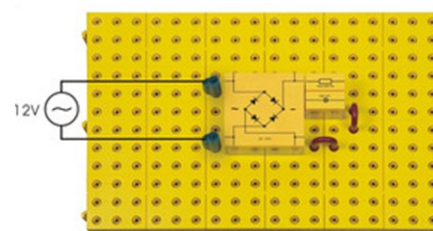
It also provides a DC Voltage supply module, DC Ampere meter module, DC Voltage meter module.

The trainer offers or than 20 basic experiments for the above topics plus variations of those experiments/It comes with a experiment manual in English and any other language requested.

The case includes the plug in board the plug modules and the accessory cables.



Plug in Modules	Qty
Resistor 680Ω,1/2W,1%	1
Resistor 1kΩ,1/2W,1%	1
Capacitor 1uF,25V	1
Potentiometer 10kΩ,0.5W	1
Transistor IC BC108	1
Diode ZD6.2V	1
Diode bridge IC -2A,100V	1
LED	2
Push-button switch single	1
Toggle switch single	1
Toggle switch dual	1
Buzzer	1
LDR Photo-resistor	1
NTC Thermistor	1
PTC Thermistor	1
DC Fan motor 6V	1
DC Volt meter module	1
DC Amp meter module	1
DC Power supply module	1
Leads, 3 color	12



## ENG 100 M1 MECHANICS 1

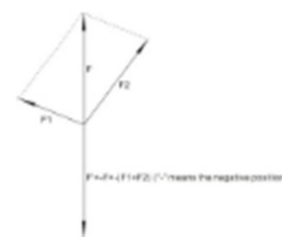
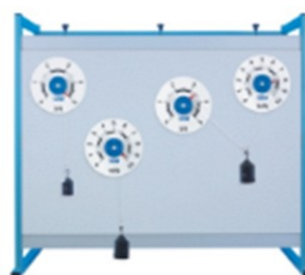
The **ENG 100M1** laboratory set has been designed to carry out experiments in Mechanics and is designed to demonstrate most of the experiments in such a way so to be seen from far distance in a classroom.

Experiments are performed on a magnetic board which facilitates for the installation of the devices and the easy and fast realization of the experiment configuration. All components are placed in plastic boxes with instructions for assembly and experiment guides.

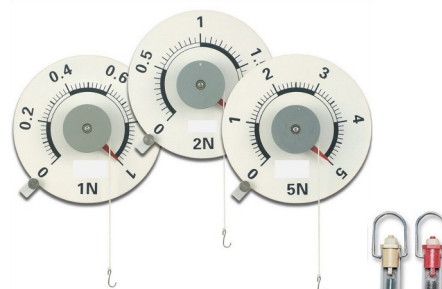
Manual instructions available in English and any other language requested.

IT can perform the following experiments in the area of basic **Mechanics**.

1. Center of mass
2. Composition of concurrent forces
3. Composition of parallel forces
4. Decomposition of forces
5. Elasticity -Hook's law
6. Serial parallel spring systems
7. Moments of forces
8. Level 1
9. Level 2
10. Level 3
11. Fixed Pulleys
12. Movable Pulleys
13. Parallel Block pulley
14. Series- Tackle pulley



Composition of forces



The set provides the following equipment which are complete and sufficient for the experiments above.

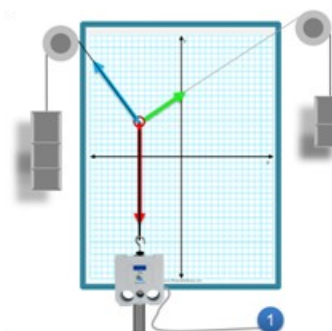
- Magnetic board, 100 cm x 70 cm ) desk top support
- Balance, metal 30 cm perforated
- Spring Dynamometer 5 N (0,1N scale) 10 N( 0,5 scale)
- 2 N (0,02N ) Disk dynamometer , 20 CM diameter
- 5 N ( 0,1 N res) rotary dynamometer
- Set of slotted weights 10 x 100gr
- Fixed Pulley  $\Phi$ 50cm
- Movable pulley  $\Phi$ 50cm
- Parallel block pulley  $\Phi$ 50cm
- Serial block pulley  $\Phi$ 30/5030 cm
- Geometric shapes, acrylic level masses
- Extension spring (K=1 )
- Draw plane-force vector board ( on magnets)

- 1
- 1
- 2
- 2
- 2
- 2
- 2
- 2
- 2
- 2
- 4
- 2
- 1

### Accessories

- Metal ruler 40cm
- Ring , metal , $\Phi$  20 mm
- Protractor
- Magnetic bases with shafts For pulleys
- String 2m and 6 hooks

- 1
- 1
- 1
- 6



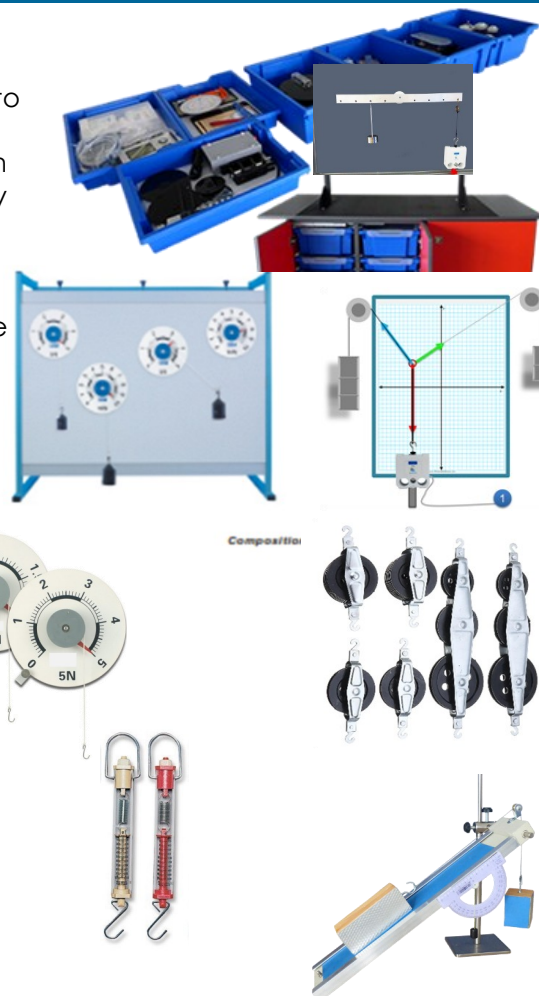


## ENG 100 M2 MECHANICS SET 2

The **ENG 100M2** laboratory set has been designed to carry out experiments in Mechanics and is designed to demonstrate most of the experiments in such a way so to be seen from far distance in a classroom.

Experiments are performed on a magnetic board which facilitates the installation of the devices for fast and easy realization of the experiment configuration while the students observe. All components are placed in plastic boxes with instructions for assembly and experiment guides. The set can perform 28 experiments covering the following theory areas in the area of solid **Mechanics**:

1. Center of mass
2. Composition of concurrent forces
3. Composition of parallel forces
4. Decomposition of forces
5. Elasticity-Hook's law
6. Potential and kinetic energy
7. Serial parallel spring systems
8. Balance and Moments of forces
9. Friction
10. Oscillations-Pendulum
11. Lever 1
12. Level 2
13. Level 3
14. Fixed Pulleys
15. Movable Pulleys
16. Parallel Block pulley
17. Series- Tackle pulley
18. Gear-3 gear box



The set provides the following equipment which are complete and sufficient for the experiments above. It also includes digital measurements with data logger and sensors.

### Components list

- Demo- board (100 x 70 cm ), with desk top supports
- Beam balance, metal 30 cm perforated
- Spring Dynamometer 5 N (0,1N scale) 10 N( 0,5 scale)
- 2 N and 5N Disk dynamometer, 20 cm diam.
- Pendulum module with magnetic holder for the board
- Inclined plane module with 3 different friction surfaces with magnetic holder for the board
- Moving blocks with 2 different surface material
- Set of slotted weights 10 x 100gr
- Fixed Pulley and Movable pulley  $\Phi$ 50cm
- Parallel block pulley  $\Phi$ 50cm
- Serial block pulley  $\Phi$ 30/5030 cm
- 3 gear box module with rotating disk for photogate
- Geometric shapes , acrylic masses, flat
- Extension spring (K=1 )
- Draw plane-force vector board (on magnets)

- 1
- 1
- 2
- 2
- 2
- 1
- 1
- 3
- 2
- 2
- 2
- 2
- 4
- 2
- 1
- 1
- 1
- 1
- 1
- 1



### Accessories

- Metal ruler 40cm
- Ring, metal,  $\Phi$  20 mm
- Protractor
- Magnetic bases with shafts
- String 2m and 20 hooks

- 1
- 1
- 1
- 6
- 1

### DATA Logger DL100

- Force sensor
- Photogate sensor
- Cables and Power set

### CAT P1



## PT 2011.2W DYNAMICS CART AND TRACK SYSTEM

### Features

- **About the track:**

Integrated aluminum alloy, surface oxidation treated, sturdy and durable.

Track size: 1.2M (graduated), width both 90mm.

- **Easy assembling**

Teachers and students can quickly complete the assembly according to the assembly instruction comes with the product in both English and Turkish language.

- **Function:**

The trolley track it is used in conjunction with **RSW200** data logging and **RS110** photogate sensors to obtain and keep experiment data image, presenting the experiment results more intuitively. It can also be used as an inclined plane for sliding and friction experiments.

- **Provided with:**

- RSW200 recording timer data logging
- 2 RS110 photogate sensors,
- 2 Friction blocks with wood, metal and rubber surfaces.
- Surface plate 50 cm with metal and rubber surface, elevating mechanism to create an incline plane and protactor.
- 2 Plastic collision cars with dimensions 165 x 78 x 40 mm (LxWxH). Equipped with 4 wheels on axles of 58mm in length. Each car has a round magnet (10mm in diameter) installed in the back plane and a spring on the front (33mm in length). The body of the cars has holes for installing metal pins that are used in various experiments.
- Storage case



### Experiment samples & sensor related:

1. Determination of average speed.  
photogateX2
2. Measure acceleration of uniformly accelerating linear motion  
photogateX2
3. The relationship between acceleration and mass  
photogateX2
4. Measure instantaneous state of velocity  
photogateX1
5. Exploring the characteristics of uniformly accelerating linear motion  
photogateX2
6. Exploring Characteristics of uniform linear motion  
photogateX2
7. Study the relationship between acceleration and external force  
photogateX2
8. Verify the law of conservation of mechanical energy Incline track method  
photogateX2
9. Explore full elastic collision  
photogateX2
10. Verify momentum theorem (variable force)  
photogateX2
11. Verify momentum theorem (constant force)  
photogateX2
12. Determination of friction co-efficiency, for rolling and sliding friction cases.  
photogateX2



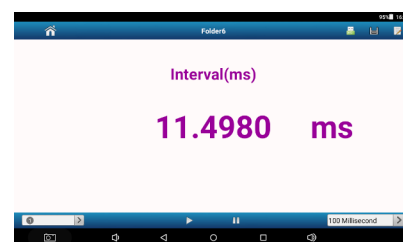
# PT 2011.2W DYNAMICS CART AND TRACK SYSTEM

## RSW 200 RECORDING TIMER DATA LOGGER

This microprocessor controlled LCD display universal counter can be used for measurement of time intervals, simple pendulum periods, velocity, acceleration, revolutions per second, frequency, pulses etc. It measures time intervals from 0.1 millisecond, and frequencies to 100 KHz. The counter is provided with a six -digit **(6)** LCD display, and a compact case making the apparatus highly suitable for student lab exercises. RS110 inputs are provided for connection of photo gate. Memory is provided for storing measured values.

### Technical specifications

- CPU: Powered by A10 processor, up to 1.5 GHz
- Operating System: Android 4.0.3
- Display Screen: 7 inches, Color, LCD 1024 × 600 dot matrix (ratio 16:9) mirror screen
- Operation Type: Android standard keys + capacitive touch screen (5 touch operation)
- RAM: 1 GB, DDR3
- Built-in Storage: 8G
- Storage: Support up to 32GB Micro SD card (TF)
- Network Connection: WIFI, 802.11 b/g/n
- Transmission Interface: USB2.0, OTG Interface
- Battery Capacity: Averages 3000mAh Stand-by Time
- Built-in DVFS dynamic FM & PM technology and Smart PMU intelligent power management system, standby capacity 20 days
- Sampling frequency: 100KHz
- AD Resolution: 12bit
- Sensor Interfaces: **4 UTP ports connecting 8 sensors simultaneously.** Return Control Function: Yes
- Modes of Operation:  
Stand alone system with software iLab V2.12 for data acquisition and analysis processing;



Specification			
Display	6 digits LCD	Counter	From 1 count to 999999 counts
Input	RS110	Memory storage	10 values
Start/Stop	From 0.0001ms to 999999ms, <b>resolution 0.01 s/1s</b>	Rechargeable battery	9V/1600mAh
Period	from 0.1ms to 999999ms, resolution 0.1ms	Accessory	2 Photo gate, RS110 cable, Power adapter
Frequency/ resolution	from 0.1 Hz to 19999Hz / 0.1 Hz	Case Dimensions	300 x 205 x 60 mm (box)
		Weight	1 kg (with box)

**RS110  
PHOTO  
GATE  
SENSOR**



Rise time: 60  $\mu$ s  
Flash memory size: 4Kb  
Case: black or white

## PCB 2110.AT2 AIR TRACK

This apparatus is designed to provide an effective system for the study of all aspects of dynamics in a virtually friction free environment. It is particularly applicable in the field of collisions, where conservation of momentum is accurately demonstrated, friction being theoretically minimal.



The kit contains all required components for a vast array of experiments covering velocity, force and acceleration, potential energy, kinetic energy, conservation of energy, SHM, motion on level and inclined planes. Gliders are designed to accept standard slotted masses for additional loads.



It is also supplied with a comprehensive accessory pack to facilitate every type of interaction.

Comes with a range of accessories including vehicles with mass attachments, catapults, and buffers.

For measurement of gliders speed, the RS 200 datalogger and RS110 photogates required.



### Typical Experiments applicable to the apparatus

- Study the linear motion under virtually frictionless conditions,
- Demonstration of Newton's second law,
- Uniform motion,
- Accelerated Motion,
- Elastic and inelastic collision,
- Conservation law and collisions,
- The conservation of momentum & energy,
- Study the dependency of mass ratio to kinetic energy.

### The Air Track has the following specifications:

- 1x Air track rail with graduated scale length: 2 m. Two rows of line holes with suitable diameter and spacing. Launching mechanism for gliders. Stands for photogates
- 2x Gliders-slides : (120 gm). Additional weight to be fitted on the vehicles with masses 50 and 100 gm.
- A set of accessories parts needed for different experiments such as: fixing screws – light-blocking frames – pulley –elastic collision device – 2 springs, 4x Glider Masses: 50gr
- 1x Air source (blower ) for air track , comprises flexible air hose of suitable length with fittings to air track. Set of necessary accessories for air track insulation.

**PT 2112.21P PROJECTILE MOTION APPARATUS**

Demonstration and study of parabolic motions.

Apparatus works with two-dimensional motion sensor, the experiment "Composition and Resolution of motion in horizontal and vertical direction" can be realized. The Projectile motion apparatus demonstrates the concept that motion in different dimensions is absolutely independent.

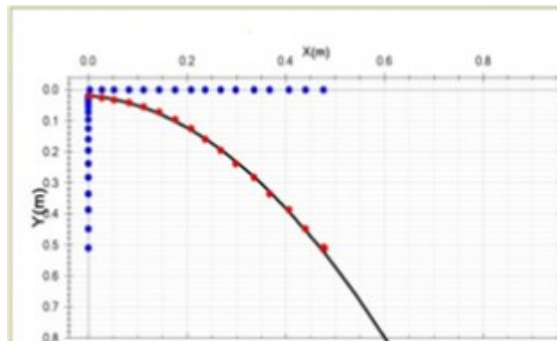
1. **Composition:** it is composed of fixed base, aluminum alloy column, horizontal throwing rail, curved arm, measuring column rail connector, two-dimensional ball fixator, measuring column rail connector accessories, level bar, etc.

2. **Function:** it can be used with two-dimensional motion sensor to depict the trajectory of moving object in the plane during horizontal throwing motion, decompose the trajectory path to get horizontal uniform motion and vertical free falling motion, get the horizontal and vertical coordinates of a certain position, verify the horizontal throwing motion law, and save data image.

**Launch angle:** 0° – 90° Plastic projectiles

Set of accessories included.

Requires Android tablet, included with the DAQ software.



**PT 2141.OM OPTICS SET 1**

Science experiment kits for geometric optics experiment with magnetic board.



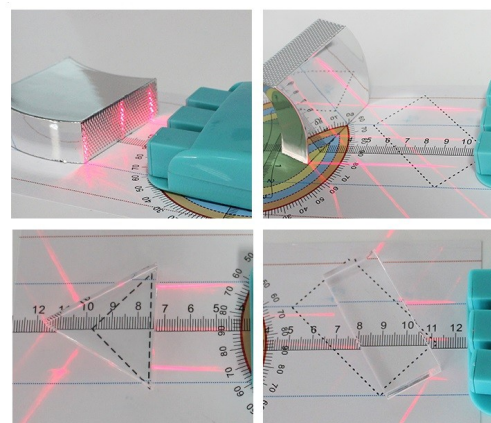
**Consisting of:**

1. Optical bench of 56cm length
2. 3-ray laser source with magnetic holder
3. F-light source
4. Translucent plate and base
5. Convex lens (Focal length F5cm)
6. Convex lens (Focal length F10cm)
7. Concave lens (Focal length F10cm)
8. White screen
9. Black screen with holes
10. F object
11. Folding board
12. Multi-function reflector
13. Eyelet imagine plate
14. Semi-circular water tank
15. Double concave prism with magnetic holder
16. Triangular prism with magnetic holder
17. Double convex prism with magnetic holder
18. Rectangular prism with magnetic holder
19. Semi-circular prism with magnetic holder
20. Square mirror
21. Scale cardboard
22. Magnetic board
23. Instruction booklet in English and Turkish language
24. Storage case



**Set of 15 topics and Experiments:**

1. Light propagation
2. Refraction law
3. Reflection law
4. Reflection of plane mirror
5. Reflection of curved mirror
6. Refractive index of prisms- 4 types
7. Light and shadow
8. Focal point of prisms lenses
9. Focal point of mirrors
10. Focal length of prisms
11. Focal length of mirrors
12. Additive / subtractive colors
13. Optical instruments
14. Concave prisms
15. Convex prisms



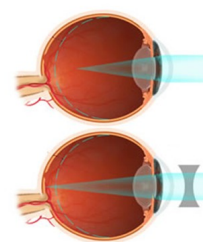


## PS 2114.OB2 OPTICAL BENCH

An optical bench allows you to perform and observe the fundamentals of optics such as image formation, reflection, refraction, and more. The bench consists of a painted, Round Stainless steel bar, two molded supports with leveling screws, and graduations from 0 cm to 120 cm, subdivided in millimeters. It is supplied complete with Lens Holders, Light Source, Slit and White Screen.

Power Supply for Light source is not included in the scope of supply.

Sliding molded bases with locking screw are also provided. Our optical bench offers excellent support and alignment of the optical elements, and provides for accurate demonstrations of basic optics principles in physics laboratories.



The following accessories are included:

1. 1 candle holder
2. 3 universal holders for lenses and slides
3. 1 white material receiving screen
4. 1 Plane mirror with holder
5. 1 LED source
6. 1 class II Laser
7. 6 sliding molded bases
8. 1 Power cord
9. 1 Double convex lens, 5.0 cm focal length
10. 1 Double convex lens, 10.0 cm focal length
11. 1 Double concave lens, 5.0 cm focal length
12. 1 Single slit – 1 Triple slit – 1 Young's slit
13. 1 Opaque screen
14. 1 spherical mirror
15. 1 slide with spherical black dot (3cm diameter)
16. 2 Polarizer filters
17. 3D eye model



All the accessories are provided with 6 mm mounting rods.

The set includes, among others, a series of accessories (color filters, slides images, diaphragms, etc.) that can demonstrate about 20 experiments, such as:

- ◆ Optical waves (Interference)
- ◆ Lunar and solar eclipse
- ◆ Refraction and reflection laws
- ◆ Images in spherical mirrors (Center of curvature, the radius of curvature, Principal axis, Principal Focus)
- ◆ Refraction through a prism and lenses (Snell's law)
- ◆ Images in lenses (Ray Diagrams for Lenses)
- ◆ The eye model (nearsightedness- myopia, farsightedness)
- ◆ Optical instruments (microscope, telescope)
- ◆ The diode laser Interference of light (constructive-destructive Interference)
- ◆ Measurement of a wavelength with Young's method
- ◆ Linear polarization
- ◆ Polarized light

Instructions manual available in English and any other language requested.

Assembly is transported in a case.