

BT 11A

Scientific Measurements

A universal testing platform for **digital experiments** and Digital measurements used in science and engineering.

BT 11A is a small size integrated apparatus **combining a data acquisition system and devices** which students can use to perform various experiments applied in all sciences. The system allows the performance of experimental measurements using at least **15 different types of sensors**. The sensors are provided separately and must be ordered by the client according to subject. BT11A top surface is built from the chemically resistant, non-porous, hygienic, non-toxic and non-destructive material. recommended for sanitary, non-toxic and clean surface applications.

BT11A is compact, modular, light and versatile apparatus useful to any science classroom and in any level of education from elementary school to high school. It introduces the students to measurement techniques using the most modern methods provided today by sensors, data loggers and computer Data analysis software. BT11A includes a build-in wireless data logger to connect to a PC system, a power supply of 6V DC and a set of equipment to contact the experiments. BT11A comes in an aluminum frame briefcase, with all devices and a sensors stored in it and with a complete pedagogical software application.

BT11A is MODULAR... Meaning that the same platform can be used for a variety of experiments by adding the different experimental modules, boards, sensors etc.

BT11A is VERSATILE... Meaning that the modules can be used in various ways to implement experiments in various areas. They are designed not of a single use but for various uses within the content of the curriculum of activities. BT11A, due to the above features, is the most **COMPACT** digital lab offered in the market by which the student can process more than **100 science experiments**.

BT11A Didactic application

The BT11A interconnects the Teacher with the Students in a uniform platform.

- Theory Introduction per science Topic with interfaces to any Student Response System or Interactive board
- Theory quizzes
- Lab Simulation for the Topic, Virtual measurement Simulations
- Data acquisition applications
- a step-by-step procedure for Student experiments activities and student quizzes jointly in BT11A provide the most modern platform in Science teaching.

The BT11A application includes also various utilities as Inventory, directing the students what equipment to use, Instructions for different devices in the kit, instructions for the software applications which are used during the teaching process.

All instructions and Documentation is included in the BT11A application making BT11A one complete **CAI - Computer Assisted Instruction** - environment for the student, having all the required information available Online.



Sensors BT 11A

- Voltage
- Pressure
- Temperature
- Force
- Relative Humidity
- Sound
- Current
- pH
- Photogate
- CO₂
- O₂
- ECG
- Respiration (Spiro)
- Magnetic Field
- Motion



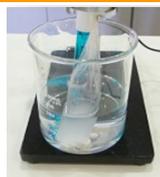
Based on each subject, the BT11A laboratory activities are the following:

PHYSICS



- Weight and mass
- Volume and Density
- Forces
- Boyant force
- Archimedes Principle
- Gravity
- Free fall
- Balance and moments
- 3rd Newton's law
- Impulse of force
- Hooke's Law
- Spring system
- Pendulum
- Types of oscillation
- Mechanical energy
- Light intensity
- Sound level
- Water-Oil thermometer
- Heat conductivity of materials
- Gay Lussac's Law
- Boyle's law
- Relative humidity 1
- Relative humidity 2
- Barometer
- Conductors Insulators
- Measuring voltage
- Measuring Current
- Calculating resistance
- Diode
- Serial circuit (1)
- Serial circuit (2)
- Parallel circuit (1)
- Parallel circuit (2)
- Capacitor performance
- Magnetic field
- Electromagnetic field
- Electromagnetic induction

CHEMISTRY



- Dilution and pH measurement of Acids and Alkalis
- Conductance of solution samples
- Catalytic decomposition and O₂ gas release
- Electrolysis of salt water
- Ionic Decay Of Salt Water
- Enthalpy changes in a series of reactions
- Exothermic and Endothermic reaction
- Heat of neutralization
- CO₂ Gas Production In Double Replacement Reaction
- Neutralization reaction and moisture changes
- Osmosis and pressure changes
- pH change is neutralization
- Pressure changes in catalytic decomposition reactions
- Pressure changes in Chemical reactions
- Redox states of transition electron
- Temperature changes associated to phase change
- Humidity changes associated to phase change
- The PH measurement
- Hess's Law Demonstration
- Stoichiometric Analysis Of Catalytic Decomposition Reaction

BIOLOGY



- Measuring the rate of photosynthesis on day time
- Measuring CO₂ level / photosynthesis at night
- Transpiration in a plant
- Respiration process during germination
- Measuring the ph of soil
- Relative Humidity of Soil
- Membrane permeability
- PH and organisms
- Decomposition reaction by enzymatic catalysis
- Sugar Fermentation
- Acidification of Milk
- Measuring CO₂ production during fermentation
- Muscle fatigue
- Body temperature regulation
- Determining your vital air capacity
- Breathing air O₂ content
- Breathing air CO₂ content
- Humidity of breathing air
- Measuring heart rate with ECG
- Exercise and heart rate

