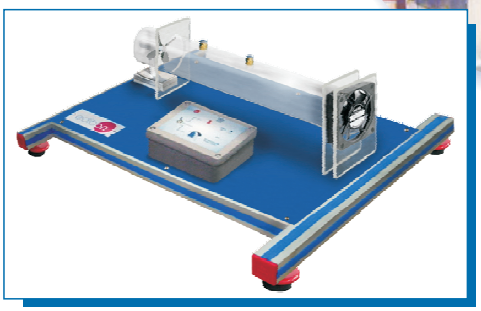
TECHNICAL AND VOCATIONAL EDUCATION
RENEWABLE ENERGY LABORATORY
(5RTV)



* Center: "....."

* Country: "....."

* Date: "....."

* Issue: "....."

Quality Certificates:

ISO 9000: Quality Management
(for Design, Manufacturing, Commercialization and After-sales service)

European Union Certificate
(total safety)

Certificates ISO 14000 and
ECO-Management and Audit Scheme
(environmental management)

Worlddidac Quality Charter Certificate
(Worlddidac Member)

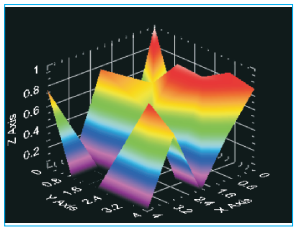
Technical and Vocational Education RenewableEnergy Laboratory

(5RTV)

Index

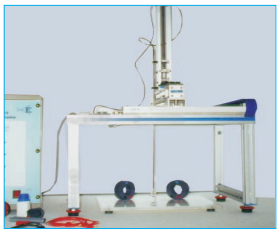
Project content

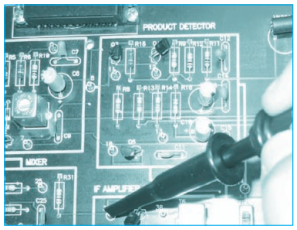
Modern design

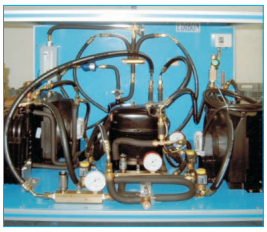


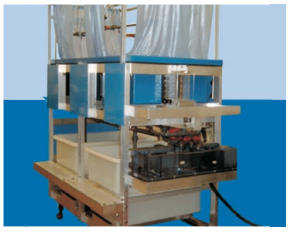
Main blocks

Products

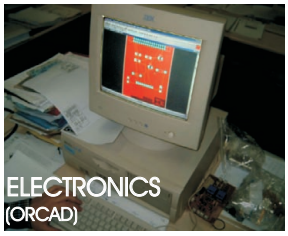


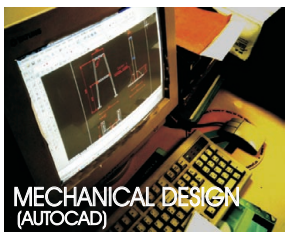






Full units design





Technical areas available

- Electricity.

*** Energy.**

- Fluids Mechanics & Aerodynamics.

- Thermodynamics & Thermotechnics.

- Process Control.

- Complements, Instruments and Tools.

*__Main area directly related with Technical and Vocational Education Renewable Energy Laboratory labelled in bold letters.__

Note: The complete technical design “is ready” at our premises

Economical Proposal

Teaching Units:

"Priority 1"

0500. Energy

0530/20S:Basic Renewable Energies. (20 CAI + CAL).
0530/PLC: PLCs Module
0531/20S: Main Advanced Renewable Energies. (20 CAI + CAL).
0531/PLC: PLCs Module.
0532/20S:Fuel Cells. Renewable Energies (20 CAI + CAL).
0532/PLC: PLCs Module.
0533/20S: Bio. Renewable Energies (20 CAI + CAL).
0533/PLC: PLCs Module.
0534/20S: Sea. Renewable Energies (20 CAI + CAL).
0534/PLC: PLCs Module
0535/20S: Geothermal. Renewable Energies (20 CAI + CAL).
0535/PLC: PLCs Module.
0536/20S: Hidro. Renewable Energies (20 CAI + CAL).
0537/20S: Organic. Renewable Energies (20 CAI + CAL)
0537/PLC: PLCs Module.
0538/20S: Turbine Troubleshooting. Renewable Energies (20 CAI + CAL).
0538/PLC: PLCs Module.
0500/ESN: EDIBON Scada-Net for Energy units .

"Priority 2"

0400. Electricity

0453-450/20S: Energy Installations (20 CAI + CAL).
0453-451/20S: Energy Installations (20 CAI + CAL).
0453-452/20S: Energy Installations (20 CAI + CAL).
0463K-460K/20S: Energy Installations "kit" (20 CAI + CAL).
0463K-461K/20S: Energy Installations "kit" (20 CAI + CAL)
0463K-462K/20S: Energy Installations "kit" (20 CAI + CAL).

0500. Energy

0510: Energy: Modular Power System Simulator. Basic Module
0511: Energy: Modular Power Simulator (ESN).
0520: Energy: Advanced Power Plant Simulator. Basic
0521: Energy: Advanced Power Plant Simulator. Medium
0522: Energy: Advanced Power Plant Simulator. Advanced

0800. Fluid Mechanics & Aerodynamics

0813-810/20S: Elementary Fluid Mechanics (20 CAI + CAL).
0813-811/20S: Elementary Fluid Mechanics (20 CAI + CAL).
0813-812/20S: Elementary Fluid Mechanics (20 CAI + CAL).

1000. Process Control

1010: Process Control. Basic Module.
1010/PLC: PLC's Module
1011: Process Control. Medium Module
1011/PLC: PLC's Module
1020: Industrial Process Module
1020/PLC: PLC's Module
1000/ESN: EDIBON Scada-Net for Process Control units

"Priority 3"

0400. Electricity

0413-410/20S: Domestic Electric Installations (20 CAI + CAL)
0413-411/20S: Domestic Electric Installations (20 CAI + CAL)
0413-412/20S: Domestic Electric Installations (20 CAI + CAL)

Complements, Instruments and Tools:

5100. Complements, Instruments and Tools

5110-1: Cupboard & Shelves Module
5120-10: Computer Module
5122: Teaching Aids Module
5124: Complete Health & Safety
5142-1: Electricity Toolkit Module
5143-20: Electronics Toolkit Module

Services:

* Furnitures:
* Electrical, Water and Air Installation and others laboratory services
* Installation of all units supplied, Starting up, Training, Teacher Training and Technology Transfe

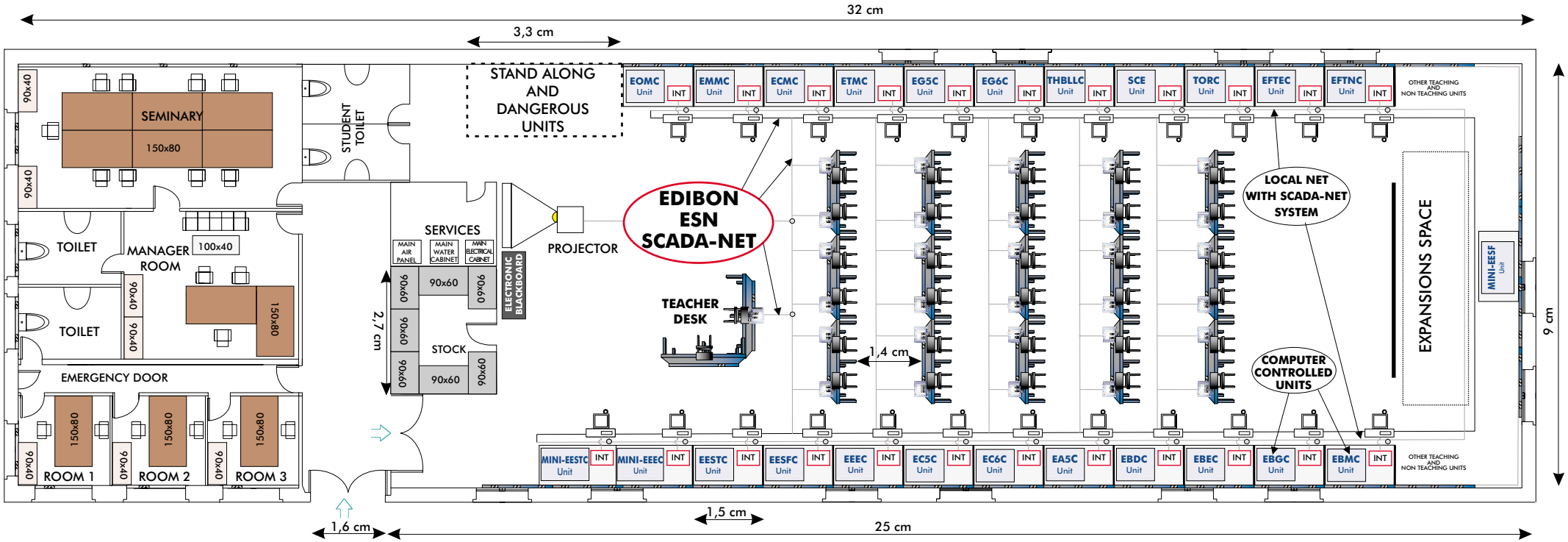
Classroom and Laboratory Lay Out

TECHNICAL AND VOCATIONAL EDUCATION

RENEWABLE ENERGY LABORATORY

(Example of Priority 1)

(5RTV)



E: 1:100

Main Teaching Units
(included in priority 1)
Priority 01:

MINI-EESTC	Computer Controlled Thermal Solar Energy Basic Unit.
MINI-EEEC	Computer Controlled Wind Energy Basic Unit.
MINI-EESF	Photovoltaic Solar Energy Modular Trainer. (Complete Version).
EESTC	Computer Controlled Thermal Solar Energy Unit.
EESFC	Computer Controlled Photovoltaic Solar Energy Unit.
EEEC	Computer Controlled Wind Energy Unit.
EC5C	Computer Controlled PEM Fuel Cell Unit
EC6C	Computer Controlled PEM Fuel Cell Advanced Unit
EA5C	Computer Controlled Alkaline Fuel Cell Unit
EBDC	Computer Controlled Biodiesel Process Unit.
EBEC	Computer Controlled Bioethanol Process Unit.
EBGC	Computer Controlled Biogas Process Unit.
EBMC	Computer Controlled Biomass Process Unit.
EOMC	Computer Controlled Waves Energy Unit.
EMMC	Computer Controlled Tidal Energy Unit.
ECMC	Computer Controlled Submarine Currents Energy Unit
ETMC	Computer Controlled Ocean Thermal Energy Unit.
EG5C	Computer Controlled Geothermal (low enthalpy) Energy Unit.
EG6C	Computer Controlled Geothermal (high enthalpy) Energy Unit.
THBLLC	Computer Controlled Heat Pump Unit (one condenser (water) and one evaporator (water)).
SCE	Computer Controlled Generating Stations Control and Regulation Simulator (System Engineering).
TORC	Computer Controlled Organic Rankine Cycle Unit
EFTEC	Computer Controlled Turbine Electric Hub Troubleshooting Learning System
EFTNC	Computer Controlled Turbine Nacelle Troubleshooting Learning System

Main target

* To help the students:

  - By “quick” understanding.
  - By “clear” understanding (clear concepts).
  - By “saving” time.
  - By “extending” the laboratory to their homes.

* To help the teachers:

  - By “easy” teaching.
  - By increasing the teaching “efficiency”.
  - By “reducing” teaching costs (less time consume).
  - By “integrating” classroom and laboratory in the same place.

Project options covered

This *"Technical and Vocational Education Renewable Energy Laboratory"* will cover the following:

a) To train students at laboratory.
b) To train trainers.
c) To be used for training and update educators in current teaching technologies.
d) To give courses to workers in the industry, as it simulates industrial process.
e) To be used for carrying out applied research, in several processes and different technical areas.
f) To be used as research tool for international projects.
g) To train other countries teachers.

Project conditions

The *"Technical and Vocational Education Renewable Energy Laboratory"* includes the following technical and commercial conditions:

a) Technical conditions:

- Laboratories adaptation.
- Installation of all units supplied.
- Starting up for all units.
- Training about the exercises to be done with any unit.
- Teacher training related with the teaching unit and the teaching techniques used.
- Technology transfer.

b) Commercial conditions:

- Packing.
- Financing Charges.
- C.I.F. Charges.

c) Other conditions:

- 8 Manuals for each teaching equipment:

. Required services manual.
. Assembly and installation manual.
. Interface and software/control console manual.
. Set in operation manual.
. Safety norms manual.
. Practices manual.
. Maintenance manual.
. Calibration manual.

TEACHING TECHNIQUES USED

3D. EDIBON THREE DIMENSIONS SYSTEM

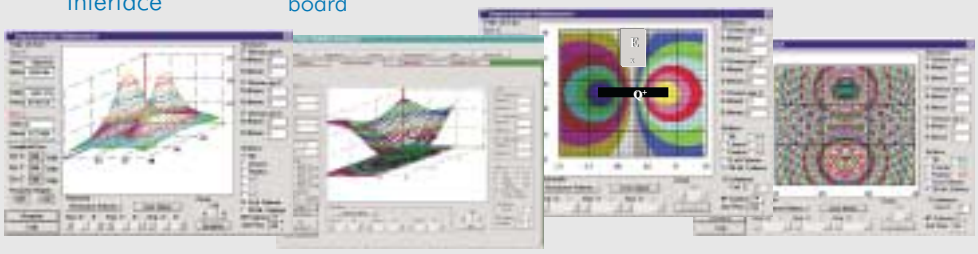

Unit


Interface


Data acquisiton board

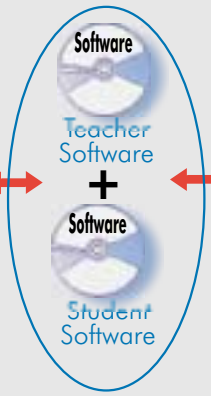
Software included:
-Control
-Data Acquisition
-Data Management

Used for:
Physics (Magnetic fields, Electrical fields, Mechanics, Acoustics, Optics, Thermodynamics and Fluid Mechanics)

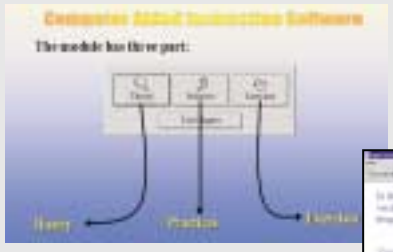


CAI. COMPUTER AIDED INSTRUCTION SYSTEM


Unit



Used for:
Basic Electronics and Electricity.
Communications.
Basic Mechanics.
Basic Fluid Mechanics.



EDAS. EDIBON DATA ACQUISITION SYSTEM

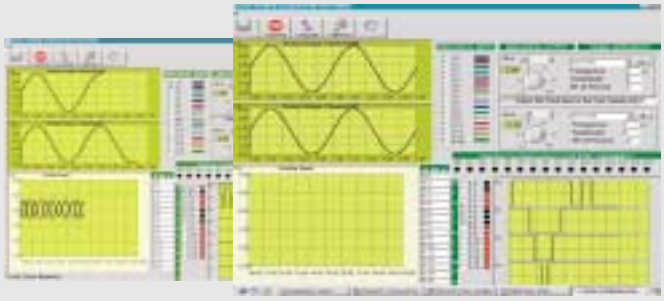

Unit


Interface


Data acquisiton board

Data Acquisition Software

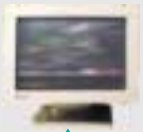
Used for:
Basic Electronics.
Communications.
Electricity.



RTC. EDIBON SYSTEM FOR HIGH ELECTRONICS (Real time control)


Unit


Data acquisiton board



Control Software

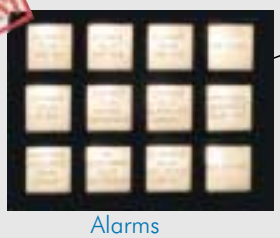
Option: Simulation Software

Used for:
High Tech Electronics (Control Electronics, Digital Electronics and Industrial Electronics).

HYBRID. **EDIBON TEACHING HYBRID SYSTEM (ENERGY)**

EDIBON PATENT

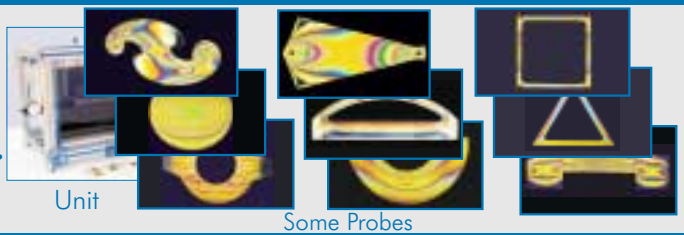
Used for:
Energy Power Plants.



Alarms

PHOTOELASTICITY

Used for:
Strength of Materials.

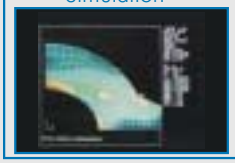


Unit

Some Probes

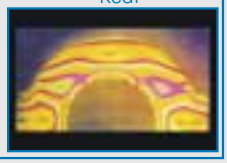
RESULTS

Simulation



Diferences between the simulation and the photoelastic reality.

Real



SACED. **EDIBON COMPUTER CONTROL SYSTEM:Control+Data Acquisition+Data Management**

EDIBON PATENT

Unit

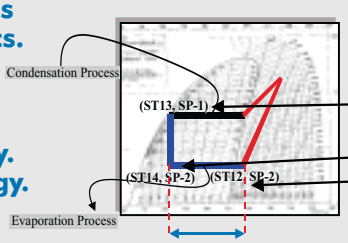
Interface

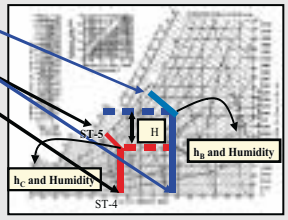
Data Acquisiton board

Software included:
-Control
-Data Acquisition
-Data Management

PLC option

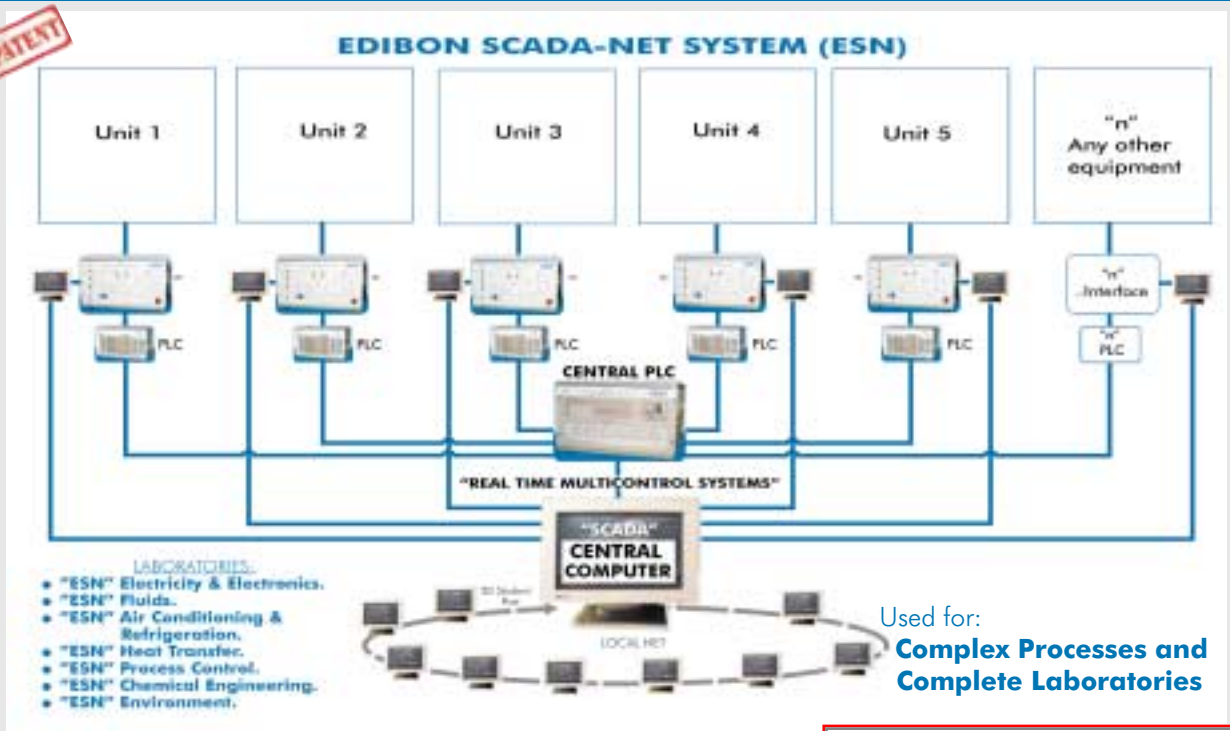
Used for:
Fluid Mechanics.
Aerodynamics.
Thermodymanics &Thermotechnics.
Process Control.
Chemical Engineering.
Food Technology.
Water Technology.
Environment.





ESN. **EDIBON SCADA-NET SYSTEM**

EDIBON PATENT



Used for:
Complex Processes and Complete Laboratories

WEB: www.edibon.com

Information in detail-CLICK HERE