edibon

Technical Teaching Equipment

Products List

100% EDIBON Design and Manufacturing

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Index
Units:

Systems: (page 12)

Physics:
- SE. **Secondary Education.**
- PL. **Physics Laboratory.**

Process and Control:
- PCMTC. **Process Control and Maintenance Center.**
- RCPCL. **Regulation, Control and Process Control Laboratory.**
- RPCTC. **Refinery and Process Control Laboratory.**

Industry:
- PPTC. **Power Plants Training Center.**
- FTPP. **Food Technology Pilots Plants.**

Scada: (Scada and Scada-Net System)
- TPDL. **Technical Professional Distance Learning.**
- Mini ESN. **Mini EDIBON Scada-Net** (for one unit and many students).
- ESN. **EDIBON Scada-Net** (for many units and many students).

Special Training Center:
- NTTSC. **New Technology Technical Skills Center.**
- TTTARC. **Teacher Technical Training and Applied Research Center.**
- MU. **Mobile Units.**

Turn-Key Projects: (page 12)

Technical Education Turn Key Projects (TETKP):
- **Secondary Education.**
- **Basic Technical and Vocational Education.**
- **Technical and Vocational Education.**
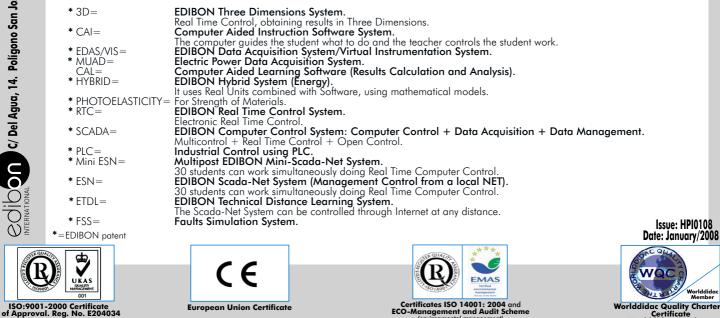- **Higher Technical Education.**

Custom made designs
Other units

Advanced custom made units using computer control.

See EDILAB products. (www.edilab.es/BETA/products)

Teaching Techniques Used

* 3D= **EDIBON Three Dimensions System.**
Real Time Control, obtaining results in Three Dimensions.
* CAI= **Computer Aided Instruction Software System.**
The computer guides the student what to do and the teacher controls the student work.
* EDAS/VIS= **EDIBON Data Acquisition System/Virtual Instrumentation System.**
* MUAD= **Electric Power Data Acquisition System.**
CAL= **Computer Aided Learning Software (Results Calculation and Analysis).**
* HYBRID= **EDIBON Hybrid System (Energy).**
It uses Real Units combined with Software, using mathematical models.
* PHOTOELASTICITY= For Strength of Materials.
* RTC= **EDIBON Real Time Control System.**
Electronic Real Time Control.
* SCADA= **EDIBON Computer Control System: Computer Control + Data Acquisition + Data Management.**
Multicontrol + Real Time Control + Open Control.
* PLC= **Industrial Control using PLC.**
* Mini ESN= **Multipost EDIBON Mini-Scada-Net System.**
30 students can work simultaneously doing Real Time Computer Control.
* ESN= **EDIBON Scada-Net System (Management Control from a local NET).**
30 students can work simultaneously doing Real Time Computer Control.
* ETDL= **EDIBON Technical Distance Learning System.**
The Scada-Net System can be controlled through Internet at any distance.
* FSS= **Faults Simulation System.**

*=EDIBON patent

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1.-PHYSICS

1.1.-3D PHYSICS (THREE DIMENSIONS) (It uses 3D System)

- **EFAC** Computer Controlled Three Dimensions (3D) Physics System:
  - **FUB** Base structure and Robot. (Common for all applications type "F").

  Sets (sensor+elements+control software) **required for each application:**
  - **FCE** Set for Electrical Fields application.
  - **FCM** Set for Magnetic Fields application.
  - **FM** Set for Mechanics Study application.
  - **FAC** Set for Acoustics Study application.
  - **FOP** Set for Optics Study application.
  - **FTT** Set for Thermodynamics Study application.

2.- ELECTRONICS

2.1.- BASIC ELECTRONICS (It uses CAI and/or LIEBA/CAL and/or EDAS/VIS System)

- **LIEBA** Basic Electronics and Electricity Integrated Laboratory:

  Power supplies: (one power supply required)
  - **FA-CO** Option 1: Power supply.
  - **EBC-100** Option 2: Base Unit, with built-in power supply.

  Available Modules:

  Basic Electricity:
  - **M1** Direct Current (D.C.) Circuits.
  - **M2** Alternating Current (A.C.) Circuits.
  - **M16** Electric Networks.
  - **M17** Electromagnetism.

  Basic Electronics. Fundamentals:
  - **M3** Semiconductors I.
  - **M4** Semiconductors II.
  - **M5** Power Supplies.
  - **M6** Oscillators.
  - **M7** Operational Amplifiers.
  - **M8** Filters.
  - **M9** Power Electronics.
  - **M10** Digital Systems and Converters.
  - **M11** Digital Electronics Fundamentals.
  - **M12** Basic Combinational Circuits.
  - **M13** Basic Sequential Circuits.
  - **M14** Optoelectronics.
  - **M15** Development Module.

  Basic Electronics: Microprocessors:
  - **M30** 16 Bits Microprocessor. (EDILAB)
  - **M31** Z80 Microprocessor. (EDILAB)
  - **M-EB** Practical Expansion Boards. (EDILAB)
  - **M32** 8051 Microcontroller. (EDILAB)
  - **M33** 68000 Microprocessor. (EDILAB)
  - **M34** DSP Microprocessor.(EDILAB)

  Basic Electronics: Transducers:
  - **M41** Resistance Transducers.
  - **M43** Applications of Temperature.
  - **M44** Applications of Light.
  - **M45** Linear Position and Force.
  - **M46** Environmental Measurements.
  - **M47** Rotational Speed and Position Control.
  - **M48** Sounds Measurements.
  - **M49** Applications of Temperature and Pressure.

  Basic Electronics: Control Electronics:
  - **M60** Analog/Digital Converters.
  - **M61** Digital/Analog Converters.
  - **M65** Control and Regulation.

  Basic Electronics: Any other possibilities:
  - **M99** Expansion Board.
    Some electronic sub-boards available:
    - **M99-1** Analogical Commutator.
    - **M99-2** Analogical Multiplier.
    - **M99-3** Function Generator.
    - **M99-4** AM Modulator.
    - **M99-5** AM Demodulator.
    * We can develop any electronic sub-board according to the application required by the customer.

  Data Acquisition:
  - **EDAS/VIS 0.25** EDIBON Data Acquisition System/Virtual Instrumentation System, for being used with Modules type "M".
  - **EDAS/VIS 1.25** EDIBON Data Acquisition System/Virtual Instrumentation System, for being used with the Modules type "M".

  Software:
  - **CAI** Computer Aided Instruction Software System, complementary to the Modules type "M".
  - **LIEBA/CAL** Computer Aided Learning Software (Result Calculation and Analysis), complementary to the Modules type "M".

2.2.- ELECTRONICS KITS (It uses CAI and/or CAL and/or EDAS/VIS System)

- **M-KITS** Basic Electronics and Electricity Assembly Kits:

  Common and necessary elements:
  - **FA-CO** Power supply.
  - **M15** Development module.

  Available Kits:
  - **M1/KIT** D.C. Circuits.
  - **M2/KIT** A.C. Circuits.
  - **M3/KIT** Semiconductors I.
  - **M4/KIT** Semiconductors II.
  - **M5/KIT** Power Supplies.
  - **M6/KIT** Oscillators.
  - **M7/KIT** Operational Amplifiers I.
  - **M8/KIT** Filters.
  - **M9/KIT** Power Electronics.
  - **M10/KIT** Digital Systems and Converters.
  - **M11/KIT** Digital Electronics Fundamentals.
  - **M12/KIT** Basic Combinational Circuits.
  - **M13/KIT** Basic Sequential Circuits.
  - **M14/KIT** Optoelectronics.
  - **M16/KIT** Electric Networks.

  Data Acquisition:
  - **EDAS/VIS 0.25** EDIBON Data Acquisition System/Virtual Instrumentation System, for being used with the Kits type "M-KIT".
  - **EDAS/VIS 1.25** EDIBON Data Acquisition System/Virtual Instrumentation System, for being used with the Kits type "M-KIT".

  Software:
  - **CAI** Computer Aided Instruction Software System, complementary to the Kits type "M-KIT".
  - **CAL** Computer Aided Learning Software (Result Calculation and Analysis), complementary to the Kits type "M-KIT".

2.3.- TRANSDUCERS AND SENSORS

- **SAIT** Transducers and Instrumentation Trainer.

  Data Acquisition:
  - **EDAS/VIS 0.25** EDIBON Data Acquisition System/Virtual Instrumentation System, for being used with "SAIT" Trainer.
  - **EDAS/VIS 1.25** EDIBON Data Acquisition System/Virtual Instrumentation System, for being used with "SAIT" Trainer.

- **BS** Modular System for the Study of Sensors: **(It uses SCADA System).**

  Base Units:
  - **BSUB** Option 1: Basic Unit.
  - **BSPC** Option 2: Basic Unit, computer controlled.

  Test Modules:
  - **BS1** Vibration and/or Deformation Test Module.
  - **BS2** Temperature Test Module.
  - **BS3** Pressure Test Module.
  - **BS4** Flow Test Module.
  - **BS5** Ovens Test Module.
  - **BS6** Liquid Level Test Module.
  - **BS7** Tachometer Test Module.
  - **BS8** Proximity Test Module.
  - **BS9** Pneumatic Test Module.

- **SPC** Computer Controlled Weighing System. **(It uses SCADA System).**
- **SCSP** Pressure Sensors Calibration System.
- **SCST** Temperature Sensors Calibration System.
- **SCSCN** Flow and Level Sensors Calibration System.

2.4.- CONTROL ELECTRONICS (It uses RTC System)

- **RYC** Computer Controlled Unit for the Study of Regulation and Control.
- **RYC/SOF** Regulation and Control Simulation Software.
- **CADDA** Computer Controlled Unit for the Study of A/D and D/A Converters.
- **CADDA/SOF** A/D and D/A Converters Simulation Software.

2.5.- DIGITAL ELECTRONICS (It uses RTC System)

- **TDS** Computer Controlled Unit for the Study of Digital Signal Processing.
- **TDS/SOF** Digital Signal Processing Simulation Software.

2.6.- INDUSTRIAL ELECTRONICS (It uses RTC System)

- **TECNEL** Computer Controlled Unit for the Study of Power Electronics.(Converters:DC/AC+AC/DC+DC/DC+AC/AC).
- **TECNEL/B** Basic Computer Controlled Unit for the Study of Power Electronics.
- **PECADS** Power Electronics Computer Aided Design and Simulation Software. (Converters: DC/AC, AC/DC, DC/DC, AC/AC).
- **SERIN/CA** Computer Controlled Industrial Servosystems Trainer (for AC motors).
- **SERIN/CC** Computer Controlled Industrial Servosystems Trainer (for DC motors).
- **SERIN/CCB** Servosystems Trainer (for DC motors).
- **SERVOS/SOF** Servosystems Simulation Software.

3.- COMMUNICATIONS

3.1.- ANALOG COMMUNICATIONS (It uses CAI and/or LICOMBA/CAL and/or EDAS/VIS System)

- **LICOMBA** Communications Integrated Laboratory:

Power supplies: (one power supply required)
- **FA-CO** Option 1: Power supply.
- **EBC-100** Option 2: Base Unit, with built-in power supply.

Available Analog Communications Modules:
- **ED-CAM** AM Communications.
- **ED-CFM** FM Communications.

Data Acquisition:
- **EDAS/VIS 0.25** EDIBON Data Acquisition System/Virtual Instrumentation System, for being used with the Modules "ED-CAM and ED-CFM".
- **EDAS/VIS 1.25** EDIBON Data Acquisition System/Virtual Instrumentation System, for being used with the Modules "ED-CAM and ED-CFM".

Software:
- **CAI** Computer Aided Instruction Software System, complementary to the Modules "ED-CAM and ED-CFM".
- **LICOMBA/CAL** Computer Aided Learning Software (Result Calculation and Analysis), complementary to the Modules "ED-CAM and ED-CFM".

3.2.- DIGITAL COMMUNICATIONS (It uses CAI and/or LICOMBA/CAL and/or EDAS/VIS System)

- **LICOMBA** Communications Integrated Laboratory:

Power supplies: (one power supply required)
- **FA-CO** Option 1: Power supply.
- **EBC-100** Option 2: Base Unit, with built-in power supply.

Available Digital Communications Modules:
- **EDICOM1** Signals Sampling and Reconstruction.
- **EDICOM2** Time Division Multiplexing (T.D.M.).PAM Transmitter and Receiver.
- **EDICOM3** MIC-TDM Transmission/Reception.
- **EDICOM4** Delta Modulation/Demodulation.
- **EDICOM5** Line Codes. Signal Modulation/Demodulation.
- **EDICOM6** Fibre Optic Transmission/Reception.

Data Acquisition:
- **EDAS/VIS 0.25** EDIBON Data Acquisition System/Virtual Instrumentation System, for being used with the Modules type "EDICOM".
- **EDAS/VIS 1.25** EDIBON Data Acquisition System/Virtual Instrumentation System, for being used with the Modules type "EDICOM".

Software:
- **CAI** Computer Aided Instruction Software System, complementary to the Modules type "EDICOM".
- **LICOMBA/CAL** Computer Aided Learning Software (Result Calculation and Analysis), complementary to the Modules type "EDICOM".

3.3.- TELEPHONY

- **CODITEL** Telephony Systems Trainer.

4.- ELECTRICITY

4.1.- BASIC ELECTRICITY

- **LIELBA** Electrical Installations Integrated Laboratory:

Frames: (applications support)
- **BASB** Option 1: Basic frame.
- **BASS** Option 2: Double frame, single side working post.

Available APPLICATIONS:
Domestic Electrical Installations:
- **AD1A** Robbery alarm station.
- **AD3A** Fire alarm station.
- **AD5** Temporization of stairs.
- **AD6A** Luminosity control station.
- **AD8** Blinds activator.
- **AD9A** Heating control station.
- **AD11A** Network analyzer.
- **AD13** Audio door entry system.
- **AD14** Audio and video door entry system.
- **AD15A** Position control station.
- **AD17A** Photoelectric control position station.
- **AD24** Position switch.
- **AD19A** Sound station.
- **AD22** Flooding control station.
- **AD23** Wireless basic control station (RF).
- **AD25A** Control station for domestic electric services through the telephone.
- **AD28A** Integral control station of domestic electric systems.
- **AD30** Gas control station.
- **AD31** Movement and sound detection and control.
- **AD32** 24 Vac / 12 Vdc circuits analyzer.
- **AD33** Installations faults simulator.

Industrial Electrical Installations:
- **AI1** Star-delta starter.
- **AI2** Starter through auto-transformer.
- **AI3** Speed commutator for Dahlander motor.
- **AI4** Starter-inverter.
- **AI5** AC wound rotor motor starter.
- **AI6** DC motor starter.
- **AI7** Automatic change of speed of a Dahlander motor with change of direction.
- **AI8** Reactive power compensation (Power factor correction).
- **AI9** People safety against indirect electrical contacts in TT neutral regimen.
- **AI10** People safety against indirect electrical contacts in TN neutral regimen.
- **AI11** People safety against indirect electrical contacts in IT neutral regimen.
- **AI12** Modular Trainer (AC Motors).
- **AI13** Modular Trainer for Electrotecnics.

Energy Installations:
- **AE1** Aerial line model.
- **AE2** Reactive energy control and compensation.
- **AE3** Test unit for magneto-thermal automatic switches.
- **AE4** Test unit for differential automatic switches.
- **AE5** Relay control station.
- **AE6** Energy counters control station.
- **AE7** Multi-functional electrical protection station.
- **AE8** Power & torque measurements of electrical motors.
- **AE9** Directional Relay: Earth fault detection. Directional power flow detection. Reactive power flow detection.

Data Acquisition:
- **MUAD** Electric Power Data Acquisition System, for being used with the LIELBA Applications type "A".

Software:
- **CAI** Computer Aided Instruction Software System, complementary used with the LIELBA Applications type "A".

- **ELE-KITS** Electrical Installations Assembly Kits:
Available ASSEMBLY KITS:
Domestic Electrical Installations:
- **KD1A** Robbery alarm station kit.
- **KD3A** Fire alarm station kit.
- **KD5** Temporization of stairs kit.
- **KD6A** Luminosity control station kit.
- **KD8** Blinds activator kit.
- **KD9A** Heating control station kit.
- **KD11A** Network analyzer kit.
- **KD13** Audio door entry system kit.
- **KD14** Audio and video door entry system kit.
- **KD15A** Position control station kit.
- **KD17A** Photoelectric control position station kit.
- **KD24** Position switch kit.
- **KD19A** Sound station kit.
- **KD22** Flooding control station kit.
- **KD23** Wireless basic control station (RF) kit.
- **KD25A** Kit of control station for domestic electric services through the telephone.
- **KD28A** Kit of integral control station of domestic electric systems.
- **KD30** Gas control station kit.
- **KD31** Movement and sound detection and control kit.
- **KD32** 24 Vac / 12 Vdc circuits analyzer kit.
- **KD33** Installations faults simulator kit.

Industrial Electrical Installations:
- **KI1** Star-delta starter kit.
- **KI2** Starter through auto-transformer kit.
- **KI3** Speed commutator for Dahlander motor kit.
- **KI4** Starter-inverter kit.
- **KI5** AC wound rotor motor starter kit.
- **KI6** DC motor starter kit.
- **KI7** Kit of automatic change of speed of a Dahlander motor with change of direction.
- **KI8** Kit of reactive power compensation (Power factor correction).
- **KI9** Kit of people safety against indirect electrical contacts in TT neutral regimen.
- **KI10** Kit of people safety against indirect electrical contacts in TN neutral regimen.
- **KI11** Kit of people safety against indirect electrical contacts in IT neutral regimen.

Energy Installations:
- **KE1** Aerial line model kit.
- **KE2** Reactive energy control and compensation kit.
- **KE3** Kit of test unit for magneto-thermal automatic switches.
- **KE4** Kit of test unit for differential automatic switches.
- **KE5** Relay control station kit.
- **KE6** Energy counters control station kit.
- **KE7** Multi-functional electrical protection station kit.
- **KE8** Kit of power & torque measurements of electrical motors.
- **KE9** Kit of directional Relay: Earth fault detection. Directional power flow detection. Reactive power flow detection.

Data Acquisition:
- **MUAD** Electric Power Data Acquisition System, for being used with the Kits type "K".

Software:
- **CAI** Computer Aided Instruction Software System, complementary used with thethe Kits type "K".

- **EIV2** Home Automation Installations Trainer.
- **EIV6** Home Automation Installations Trainer.

4.2.- ELECTRICITY DEMONSTRATION
- **PDL**   Lamps Demonstration Panel.
- **PDCE-P**   Electric Cables Demonstration Panel (Power).
- **PDCE-S**   Electric Cables Demonstration Panel (Signalling).
- **PDF**   Fuses Demonstration Panel.

4.3.- ELECTRICAL INSTALLATIONS WORKSHOP
- **EIWS**   Including furniture, tools, components, etc.

4.4.- ELECTRICAL MACHINES
- **LIMEL**   Integrated Laboratory for Electrical Machines:
    ### Common Electrical Machines Base Units
    - **EME**   Electrical Machines Unit. (Advanced option).
    - **EME/M**   Electrical Machines Unit. (Intermediate option).
    - **EME/B**   Electrical Machine Unit. (Basic option).
    ### Measurement Units
    - **MULT**   Digital Multimeter.
    - **EAL**   Network Analyzer Unit.
    - **EALD**   Network Analyzer Unit, with Computer Data Acquisition + Oscilloscope (PC).
    - **EALDG**   Network Analyzer Unit, with Computer Data Acquisition+Oscilloscope (PC)+Oscilloscope Display.
    - **MUAD**   Electric Power Data Acquisition System.
    ### Loads
    - **RCL3R**   Resistive, Inductive and Capacitive Loads Module.
    - **Individual elements:**
        - **IND**   Inductance.
        - **CON**   Box of Condensers.
        - **REV**   Variable Resistance.
        - **REF**   Fixed Resistance.

    ### Motors
    - **EMT**   Motors (available 21 different type of motors).

    ### Brakes
    - **FRE-FE**   Electronic Brake.
    - **FREND**   Dynamo Brake .
    - **DI-FRE**   Pendular Dynamo Brake.
    - **FRENP**   Magnetic Powder Brake.
    - **FREPR**   Prony Brake.
    - **FRECP**   Eddy Current Brake.

    COMPLEMENTARY ELEMENTS:
    ### Transformers
    - **ETT**   Three-phase and Single-phase Transformers Unit.
    - **TPPT**   Three- phase Power Transformer Unit.
    - **EMPTA**   Auxiliary Transformer and Protection Module.
    - **Individual elements:**
        - **AUTR**   Variable Auto-transformer.
        - **TRANS**   Single-phase transformer.
        - **TRANS/3** Three-phase transformer.

    ### DC Motor Speed Control
    - **VVCC**   DC Motors Speed Controller.

    ### AC Motor Speed Control
    - **VVCA**   AC Motors Speed Controller.

    ### PLC (Programmable Logic Controller)
    - **PLC-PI**   PLC Module for the Control of Industrial Processes. (For controlling the Electrical Machines Unit "EME").
    - **EDIBON FP-X-CPU** PLC, with no additional elements.
    ### Tachogenerator
    - **TECNEL/T** Tachogenerator.
    ### Data Acquisition:
    - **MUAD**   Electric Power Data Acquisition System, for using with the Electrical Machines Unit "EME".
    ### Software:
    - **CAI**   Computer Aided Instruction Software System.
- **EMT-S**   Cut Away Motors (available 21 different type of cut away motors).

- **ESAM**   Faults Simulation Trainer in Electrical Motors.
- **ERP**   Protection Relay Test:
    - **ERP-UB**   Protection and Relay Test Unit. (Common for the relay modules type "ERP").
    ### Available Relay Modules:
    - **ERP-SFT** Overcurrent and Earth Fault Relay Module.
    - **ERP-SDND** Directional/Non Directional Overcurrent Relay Module.
    - **ERP-PDF** Differential Protection Relay Module.
    - **ERP-MA**   Feeder Management Relay Module.
    - **ERP-PD**   Distance Protection Relay Module.

4.5.- ELECTRIC MACHINES KITS
- **EMT-KIT** Disassembly Machines Kit.

5.- ENERGY

5.1.- ENERGY: SIMULATION
- **SE3**   Pure Software Power Plant Simulator: Generation, Transformation, Transport, Distribution and Consumption, using just computers.
    - **SE3/HR**   Hydraulic Generation Version.
    - **SE3/T**   Thermal Generation Version.
    - **SE3/N**   Nuclear Generation Version.

5.2.- ENERGY POWER PLANTS
- **Mini PSS12** Power Plant Simulator: Generation, Transformation, Transport, Distribution and Consumption. **(It uses HYBRID System).**
- **PSS12**   Complete Power Plant Simulator: Generation, Transformation, Transport, Distribution and Consumption. (8 different Electric Power Plants can be simulated). **(It uses HYBRID System).**

5.3.- ALTERNATIVE ENERGIES
- **EESTC**   Computer Controlled Thermal Solar Energy Unit. **(It uses SCADA System).**
- **EEST**   Thermal Solar Energy Unit.
- **EESFC**   Computer Controlled Photovoltaic Solar Energy Unit. **(It uses SCADA System).**
- **EESFB**   Photovoltaic Solar Energy Basic Unit.
- **MINI-EESF** Photovoltaic Solar Energy Modular Trainer.
- **EEEC**   Computer Controlled Wind Energy Unit. **(It uses SCADA System).**
- **EEE**   Wind Energy Unit.
- **BPPC**   Computer Controlled Teaching and Research Biodiesel Pilot Plant. **(It uses SCADA System).**

6.- SYSTEMS & AUTOMATICS

6.1.- SYSTEMS
- **SCE**   Computer Controlled Generating Stations Control and Regulation Simulator (System Engineering).**(It uses SCADA System).**
- **SBB**   Ball and Beam System.
- **CPVM**   DC Motor Position and Speed Control.

6.2.- AUTOMATICS
- **PLC-PI**   PLC Module for the Control of Industrial Processes. (For working with EDIBON Teaching Units).
- **PLCE**   PLC Trainer.
- **EDIBON FP-X-CPU** PLC, with no additional elements.
- **EPID/T**   Industrial Regulation Trainer, PID type. (Temperature).
- **CECI**   Industrial Controllers Trainer.
- **CRCI**   Industrial Controllers Networking.
- **CEAB**   Trainer for Field Bus Applications.
- **CEAC**   Controller Tuning Trainer.

6.3.- REGULATION AND CONTROL (It uses RTC System)
- **RYC**   Computer Controlled Teaching Unit for the Study of Regulation and Control.
- **RYC/SOF** Regulation and Control Simulation Software.

7.- MECHANICS & MATERIALS

7.1.- BASIC MECHANICS (It uses CAI and/or LIMEBA/CAL System)

- **LIMEBA**   Basic Mechanics Integrated Laboratory:

Modules:
  - **MECA1**   Statics Experiments.
  - **MECA2**   Load Elevation Mechanisms Experiments.
  - **MECA3**   Transmissions Experiments.
  - **MECA4**   Dynamics Experiments.
  - **MECA5**   Friction Experiments.
  - **MECA6**   Special Mechanisms Experiments.

Software:
  - **CAI**   Computer Aided Instruction Software System, complementary to the Modules type "MECA".
  - **LIMEBA/CAL**   Computer Aided Learning Software System (Result Calculation and Analysis), complementary to the Modules type "MECA".

7.2.- GENERAL MECHANICS

7.2.1.- AUTOMOTIVE MECHANISMS
  - **MFT**   Drum Brake System.
  - **MEM**   Plate Clutch.
  - **MFD**   Disk Brake.
  - **MCC**   Gearbox.
  - **MDC**   Differential-Crownwheel and Pinion.
  - **MFF**   Braking and Accelerating Forces Unit.
  - **MGE**   Gear Generation Unit.

7.2.2.- GEARS AND TRANSMISSIONS
  - **MEC**   Overdrive Unit.
  - **MEE**   Geared Lifting Machine.
  - **MBW**   Borg-Warner Automatic Transmission.
  - **MED**   Static and Dynamic Balancing Unit.
  - **MTE1**   Epicyclic Gear Unit (1 element).
  - **MTE2**   Epicyclic Gear Unit (2 elements).
  - **MTE3**   Epicyclic Gear Unit (3 elements).
  - **MTE4**   Torque Reaction Kit for use with MTE3.

7.2.3.- MECHANISMS
  - **MSH**   Simple Hydraulic System.
  - **MBD**   Slider Crank Mechanism.
  - **MYE**   Scotch Yoke Mechanism.
  - **MBM1**   Slotted Link Mechanism.
  - **MBM2**   Whitworth Quick Return Mechanism.
  - **MCA**   Chain Mechanism.
  - **MME**   Geneva Stop Mechanism.
  - **MAC**   Coupling Mechanism.
  - **MUN**   Hook's Joint Mechanism.
  - **MEX**   Cam and Follower Mechanism.
  - **MUV**   Constant Velocity Joint Mechanism.
  - **MBI**   Crank Mechanism.

7.2.4.-LUBRICATION.WEAR.FRICTION
  - **MCF**   Belt Friction Unit.
  - **MEF**   Friction Study Unit.

7.3.- AUTOMOTIVE
7.3.1.- SENSORS AND BASIC ELECTRICITY OF AUTOMOBILE
7.3.2.- ELECTRICITY AND ELECTRONICS OF AUTOMOBILE
7.3.3.- MOTORS
7.3.4.- INJECTION SYSTEMS
7.3.5.- GENERAL AUTOMOTIVE MECHANICS

7.4.- SPECIAL MECHANICS & FOUNDRY
- **MCAM**   Bell Casting, Basic Training Set.(Basic Set).
- **MCLA**   Foundry, Building-up Training Set.(1 Training Set).
- **MCEN**   Centrifugal Casting, Building-up Training Set.(2 Training Set).

7.5.- STRENGTH OF MATERIALS

7.5.1.- GENERAL STRENGTH OF MATERIALS
  - **MVV**   Unsymmetrical Cantilever Unit .
  - **MUP**   Loading of Struts Unit.
  - **MTP**   Twist and Bend Machine.
  - **MFV**   Beam Deflection Unit.
  - **MTB**   Torsion Unit.
  - **MFLT**   Strut Unit.
  - **MVS**   Suspension Bridge Unit.
  - **MFL**   Two Pinned Arch Unit.
  - **MPO**   Portal Frame Unit.
  - **MDB**   Deflection of Curved Bars Unit.
  - **MMF**   Shear Force and Bending Momentum Unit.
  - **MVL**   Free Vibration Unit.
  - **MVLF**   Free & Forced Vibration Unit.
  - **MOT**   Torsional Oscillations Unit.
  - **MAE**   Acceleration of Geared System Unit.
  - **MES**   Simple Balancing Unit.
  - **MBU**   Universal Bench Mounted Frame.
  - **MCG**   Strain Gauge Calibration Unit
  - **MCD**   Thin Cylinder Unit.
  - **EEF**   Fatigue Testing Unit.
  - **EEU/20KN**   Universal Material Testing Unit.
  - **EEFCR**   Creep Testing Unit.
  - **EEICI**   Charpy and Izod Impact Testing Unit.
  - **EEDB**   Brinell Hardness Testing Unit.

7.5.2.- STRENGTH OF MATERIALS (PHOTOELASTICITY)
  - **EFO**   Photoelastic Unit. (Qualitative tests). **(It uses PHOTOELASTICITY System).**
  - **EFOC**   Photoelastic Unit with strain gauge measurer. (Qualitative and quantitative tests). **(It uses PHOTOELASTICITY System).**
  - **EFO/RMC**   Strength of Materials Basic Unit with quantitative measurement system. (Compression, strength, torsion). (Quantitative tests).

7.6.- BASIC CUT AWAY MECHANISMS

7.7.- GENERAL CUT AWAY MECHANISMS

7.8.- BUILDING (It uses SCADA System)

- **TIAC**   Computer Controlled Acoustic Impedance Tube/Acoustic Insulation Test Unit.
- **TDRC**   Compute Controlled Noise Control Demonstration Unit.
- **TEVC**   Computer Controlled Ventilation Trainer.
- **TCMC**   Computer Controlled Thermal Conductivity of Building Materials Unit.
- **LIELBA**   Electrical Installations Integrated Laboratory.
    (Available Applications of: Alarms, Lighting, Heating, Intercom/Interphone Systems, Sound, Control Stations (Detectors), etc).

7.9.- CIVIL ENGINEERING

7.10.- AGRICULTURAL ENGINEERING

7.11.- OTHER ENGINEERINGS

8.- FLUID MECHANICS & AERODYNAMICS

8.1.- FLUID MECHANICS (Basic) (It uses CAI and/or CAL System)

- **LIFLUBA**   Basic Fluids Mechanics Integrated Laboratory:

Base Service Units:
- ● **FME00**   Hydraulics Bench.
- ● **FME00/B**   Basic Hydraulic Feed System.

Available Modules:
- ● **FME01**   Impact of Jet.
- ● **FME02**   Flow over Weirs.
- ● **FME03**   Bernoulli's Theorem Demonstration.
- ● **FME04**   Orifice Discharge.
- ● **FME05**   Energy Losses in Bends.
- ● **FME06**   Osborne-Reynolds Demonstration.
- ● **FME07**   Energy Losses in Pipes.
- ● **FME08**   Hydrostatic Pressure.
- ● **FME09**   Flow Visualization in Channels.
- ● **FME10**   Dead Weight Calibrator.
- ● **FME11**   Metacentric Height.
- ● **FME12**   Series-Parallel Pumps.
- ● **FME13**   Centrifugal Pump Characteristics.
- ● **FME14**   Free and Forced Vortices.
- ● **FME15**   Water Hammer.
- ● **FME16**   Pelton Turbine.
- ● **FME17**   Orifice and Free Jet Flow.
- ● **FME18**   Flow Meter Demonstration.
- ● **FME19**   Cavitation Demonstration.
- ● **FME20**   Laminar Flow Demonstration.
- ● **FME21**   Radial Flow Turbine.
- ● **FME22**   Venturi, Bernoulli and Cavitation Unit.
- ● **FME23**   Basic Pipe Network Unit.
- ● **FME24**   Unit for the study of Porous Beds in Venturi Tubes (Darcy's Equation).
- ● **FME25**   Flow Channel, 1m. length.
- ● **FME26**   Depression Measurement System (vacuum gauge).
- ● **FME27**   Axial Flow Turbine.
- ● **FME28**   Francis Turbine.
- ● **FME29**   Kaplan Turbine.

Software:
- **CAI**   Computer Aided Instruction Software System, complementary to the Modules type "FME".
- **FME/CAL**   Computer Aided Learning Software(Results Calculation and Analysis), complementary to the Modules type "FME".

8.2.- FLUID MECHANICS (General)

- **BHI**   Hydrostatics Bench.
- **LFA**   Laminar Flow Visualization Unit.
- **AFTC**   Computer Controlled Fluid Friction in Pipes, with Hydraulics Bench (FME00). **(It uses SCADA System).**
- **AFT**   Fluid Friction in Pipes, with Hydraulics Bench (FME00).
- **AFT/B**   Fluid Friction in Pipes, with Basic Hydraulic Feed System (FME00/B).
- **AFT/P**   Fluid Friction in Pipes.
- **AFT/CAL**   Computer Aided Learning Software (Results Calculation and Analysis), complementary to the units type "AFT".
- **AMTC**   Computer Controlled Pipe Network Unit, with Hydraulics Bench (FME00). **(It uses SCADA System).**
- **AMT**   Pipe Network Unit, with Hydraulics Bench (FME00).
- **AMT/B**   Pipe Network Unit, without Hydraulics Bench (FME00).
- **EGAC**   Computer Controlled Water Hammer Unit. **(It uses SCADA System).**
- **HMM**   Manometers & Multimanometers:
  - **HMM-W500**   U-shape Double Manometer.
  - **HMM-U1000**   U-shape Manometer.
  - **HMM-I1000**   Inclined Multimanometer with 20 manometric tubes of 250mm. length.
  - **HMM-V500**   Multimanometer with 8 manometric tubes of 500 mm. Length, vertical position.
  - **HMM-4B**   4 Bourdon type Manometers Unit.
- **HVB**   Falling Spere Viscosimeter and Drag Coefficient.
- **UVF**   Flow Visialization Unit.
- **FMDU**   Flow Meter Demonstration Unit.

8.3.- FUID MECHANICS (Flow Channels)

- **CFC**   Computer Controlled Flow Channels (section: 80mm): **(They use SCADA System).**

  Available versions:
  - **CFC 80/2**   Computer Controlled Flow Channel, section: 80 mm, length: 2.5 m.
  - **CFC 80/5**   Computer Controlled Flow Channel, section: 80 mm, length: 5 m.
- **CF**   Flow Channels (section: 80mm).

  Available versions:
  - **CF 80/2**   Flow Channel, section:80mm., length:.2.5m.
  - **CF 80/5**   Flow Channel, section: 80mm., length: 5m.
- **CFGC**   Computer Controlled Flow Channels (section: 300mm)**(They use SCADA System).**

  Available versions:
  - **CFGC300/5**   Computer Controlled Flow Channel, section: 300 mm, length: 5 m.
  - **CFGC300/7**   Computer Controlled Flow Channel, section: 300 mm, length: 7.5 m.
  - **CFGC300/10**   Computer Controlled Flow Channel, section: 300 mm, length: 10 m.
- **CFG**   Flow Channels (section:300 mm).

  Available versions:
  - **CFG300/5**   Flow Channel, section: 300 mm, length: 5 m.
  - **CFG300/7**   Flow Channel, section: 300 mm, length: 7.5 m.
  - **CFG300/10**   Flow Channel, section: 300 mm, length: 10 m.
- **CAS**   Sediment Transport Demonstration Channel.

8.4.- HYDRAULIC MACHINES (Pumps)

- **PBOC**   Computer Controlled Multipump Testing Bench. (4 types of pumps).**(It uses SCADA System).**
- **PBCC**   Computer Controlled Centrifugal Pump Bench. **(It uses SCADA System).**
- **PBCB**   Centrifugal Pump Bench.
- **PBSPC**   Computer Controlled Series/Parallel Pumps Bench. **(It uses SCADA System).**
- **PBSPB**   Series/Parallel Pumps Bench.
- **PBEC**   Computer Controlled Gear Pump Bench. **(It uses SCADA System).**
- **PBAC**   Computer Controlled Axial Pump Bench. **(It uses SCADA System).**
- **PBRC**   Computer Controlled (Reciprocating) Plunger Pump Bench. **(It uses SCADA System).**

8.5.- HYDRAULIC MACHINES (Fans)

- **HVCC**   Computer Controlled Centrifugal Fan Teaching Trainer. **(It uses SCADA System).**
- **HVCB**   Centrifugal Fan Teaching Trainer.
- **HVAC**   Computer Controlled Axial Fan Teaching Trainer. **(It uses SCADA System).**
- **HVAB**   Axial Fan Teaching Trainer.

8.6.- HYDRAULIC MACHINES (Turbines) (It uses SCADA System)

- **TFRC**   Computer Controlled Radial Flow Turbine.
- **TPC**   Computer Controlled Pelton Turbine.
- **TFAC**   Computer Controlled Axial Flow Turbine.
- **TTVC**   Computer Controlled Steam Turbine.
- **HTIC**   Computer Controlled Experimental Impulse Turbine.
- **HTRC**   Computer Controlled Experimental Reaction Turbine.
- **HTVC**   Computer Controlled Solar/Heat Source Vapour Turbine.

8.7.- AERODYNAMICS (Basic)

- **TA50/250C**   Computer Controlled Aerodynamic Tunnel, 50 x 250mm. **(It uses SCADA System).**
- **TA50/250**   Aerodynamic Tunnel, 50x250 mm.

8.8.- AERODYNAMICS (General) (It uses SCADA System)

- **TA 1200/1200**   Computer Controlled Aerodynamic Tunnel, 1200x1200 mm.
- **TA 500/500**   Computer Controlled Water Tunnel, 500x500 mm.

9.- THERMODYNAMICS & THERMOTECHNICS

9.1.- REFRIGERATION

BASIC REFRIGERATION

- **TCRC** Computer Controlled Refrigeration Cycle Demonstration Unit. **(It uses SCADA System).**

- **TCRB** Refrigeration Cycle Demonstration Unit.

GENERAL REFRIGERATION

- **THAR SERIES.** Computer Controlled Refrigeration + Air Conditioning Units: **(They uses SCADA System).**

        Available units:

  - **THAR22C.** Computer Controlled Air Conditioning + Refrigeration Unit, (two condensers (water and air) and two evaporators (water and air)).

  - **THAR2LC.** Computer Controlled Air Conditioning + Refrigeration Unit, (two condensers (water and air) and one evaporator (water)).

  - **THARL2C.** Computer Controlled Air Conditioning + Refrigeration Unit, (one condenser (water) and two evaporators (water and air)).

  - **THARA2C.** Computer Controlled Air Conditioning + Refrigeration Unit, (one condenser (air) and two evaporators (water and air)).

  - **THARLLC.** Computer Controlled Air Conditioning + Refrigeration Unit, (one condenser (water) and one evaporator (water)).

  - **THARALC.** Computer Controlled Air Conditioning + Refrigeration Unit, (one condenser (air) and one evaporator (water)).

- **THAR SERIES** Refrigeration + Air Conditioning Units:

        Available units:

  - **THAR22B.** Air Conditioning + Refrigeration Unit,(two condensers (water and air) and two evaporators (water and air)).

  - **THAR2LB.** Air Conditioning + Refrigeration Unit,(two condensers (water and air) and one evaporator (water)).

  - **THARL2B.** Air Conditioning + Refrigeration Unit, (one condenser (water) and two evaporators (water and air)).

  - **THARA2B.** Air Conditioning + Refrigeration Unit, (one condenser (air) and two evaporators (water and air)).

  - **THARLLB.** Air Conditioning + Refrigeration Unit, (one condenser (water) and one evaporator (water)).

  - **THARALB.** Air Conditioning + Refrigeration Unit, (one condenser (air) and one evaporator (water)).

SPECIAL REFRIGERATION

- **TPVC** Computer Controlled Vortex Tube Refrigerator Unit. **(It uses SCADA System).**

- **TPCC** Computer Controlled Contac Plate Freezer. **(It uses SCADA System).**

- **TEVC** Computer Controlled Ventilation Trainer. **(It uses SCADA System).**

9.3.- HEATING

- **EACC** Computer Controlled Hot Water Production and Heating Teaching Unit. **(It uses SCADA System).**

9.4.- HEAT PUMPS

- **THIBAR22C.** Computer Controlled Heat Pump + Air Conditioning + Refrigeration Unit with Cycle Inversion Valve, (two condensers (water and air) and two evaporators (water and air)).**(It uses SCADA System).**

- **THIBAR22B.** Heat Pump + Air Conditioning + Refrigeration Unit with Cycle Inversion Valve, (two condensers (water and air) and two evaporators (water and air)).

- **THIBAR44C.** Computer Controlled Heat Pump + Air Conditioning + Refrigeration Unit with Cycle Inversion Valve, (four condensers (two of water and two of air) and four evaporators (two of water and two of air)).**(It uses SCADA System).**

- **THIBAR44B.** Heat Pump + Air Conditioning + Refrigeration Unit with Cycle Inversion Valve, (four condensers (two of water and two of air) and four evaporators (two of water and two of air)).

- **THB SERIES.** Computer Controlled Heat Pump Units : **(They uses SCADA System).**

        Available units:

  - **THB22C.** Computer Controlled Heat Pump Unit, (two condensers (water and air) and two evaporators (water and air)).

  - **THB2LC.** Computer Controlled Heat Pump Unit, (two condensers (water and air) and one evaporator (water)).

  - **THBL2C.** Computer Controlled Heat Pump Unit, (one condenser (water) and two evaporators (water and air)).

  - **THBA2C.** Computer Controlled Heat Pump Unit, (one condenser (air) and two evaporators (water and air)).

  - **THBLLC.** Computer Controlled Heat Pump Unit, (one condenser (water) and one evaporator (water)).

  - **THBALC.** Computer Controlled Heat Pump Unit, (one condenser (air) and one evaporator (water)).

  - **THB2AC.** Computer Controlled Heat Pump Unit, (two condensers (water and air) and one evaporator (air)).

  - **THBLAC.** Computer Controlled Heat Pump Unit, (one condenser (water) and one evaporator (air)).

  - **THBAAC.** Computer Controlled Heat Pump Unit, (one condenser (air) and one evaporator (air)).

- **THB SERIES.** Heat Pump Units :

        Available units:

  - **THB22B.** Heat Pump Unit, (two condensers (water and air) and two evaporators (water and air)).

  - **THB2LB.** Heat Pump Unit, (two condensers (water and air) and one evaporator (water)).

  - **THBL2B.** Heat Pump Unit, (one condenser (water) and two evaporators (water and air)).

  - **THBA2B.** Heat Pump Unit, (one condenser (air) and two evaporators (water and air)).

  - **THBLLB.** Heat Pump Unit, (one condenser (water) and one evaporator (water)).

  - **THBALB.** Heat Pump Unit, (one condenser (air) and one evaporator (water)).

  - **THB2AB.** Heat Pump Unit, (two condensers (water and air) and one evaporator (air)).

  - **THBLAB.** Heat Pump Unit, (one condenser (water) and one evaporator (air)).

  - **THBAAB.** Heat Pump Unit, (one condenser (air) and one evaporator (air)).

- **TBTC** Computer Controlled Thermo-Electric Heat Pump. **(It uses SCADA System).**

- **TBCF** Bomb Calorimeter Set for Testing Calorific Value of Fuels.

9.5.- AIR CONDITIONING
GENERAL AIR CONDITIONING
- **THA SERIES.** Computer Controlled Air Conditioning Units: **(They use SCADA System).**
  Available units:
  - **THA2AC.** Computer Controlled Air Conditioning Unit, (two condensers (water and air) and one evaporator (air)).
  - **THALAC.** Computer Controlled Air Conditioning Unit, (one condenser (water) and one evaporator (air)).
  - **THAAAC.** Computer Controlled Air Conditioning Unit, (one condenser (air) and one evaporator (air)).

- **THA SERIES.** Air Conditioning Units:
  Available units:
  - **THA2AB.** Air Conditioning Unit, (two condensers (water and air) and one evaporator (air)).
  - **THALAB.** Air Conditioning Unit, (one condenser (water) and one evaporator (air)).
  - **THAAAB.** Air Conditioning Unit, (one condenser (air) and one evaporator (air)).

- **THAR SERIES.** Computer Controlled Refrigeration + Air Conditioning Units. **(They use SCADA System).**
  Available units:
  - **THAR22C.** Computer Controlled Air Conditioning + Refrigeration Unit, (two condensers (water and air) and two evaporators (water and air)).
  - **THAR2LC.** Computer Controlled Air Conditioning + Refrigeration Unit, (two condensers (water and air) and one evaporator (water)).
  - **THARL2C.** Computer Controlled Air Conditioning + Refrigeration Unit, (one condenser (water) and two evaporators (water and air)).
  - **THARA2C.** Computer Controlled Air Conditioning + Refrigeration Unit, (one condenser (air) and two evaporators (water and air)).
  - **THARLLC.** Computer Controlled Air Conditioning + Refrigeration Unit, (one condenser (water) and one evaporator (water)).
  - **THARALC.** Computer Controlled Air Conditioning + Refrigeration Unit, (one condenser (air) and one evaporator (water)).

- **THAR SERIES.** Refrigeration + Air Conditioning Units:
  Available units:
  - **THAR22B.** Air Conditioning + Refrigeration Unit, (two condensers (water and air) and two evaporators (water and air)).
  - **THAR2LB.** Air Conditioning + Refrigeration Unit, (two condensers (water and air) and one evaporator (water)).
  - **THARL2B.** Air Conditioning + Refrigeration Unit, (one condenser (water) and two evaporators (water and air)).
  - **THARA2B.** Air Conditioning + Refrigeration Unit, (one condenser (air) and two evaporators (water and air)).
  - **THARLLB.** Air Conditioning + Refrigeration Unit, (one condenser (water) and one evaporator (water)).
  - **THARALB.** Air Conditioning + Refrigeration Unit (one condenser (air) and one evaporator (water)).

ADVANCED AIR CONDITIONING
- **TAAC** Computer Controlled Air Conditioning Laboratory Unit. **(It uses SCADA System).**
- **TAAB** Air Conditioning Laboratory Unit.
- **TARC** Computer Controlled Recirculating Air Conditioning Unit. **(It uses SCADA System).**
- **TARB** Recirculating Air Conditioning Unit.
- **TAAUC** Computer Controlled Automobile Air Conditioning Trainer. **(It uses SCADA System).**
- **TAAU** Automobile Air Conditioning Trainer.

9.6.- COOLING TOWERS
- **TTEC** Computer Controlled Bench Top Cooling Tower. **(It uses SCADA System).**
- **TTEB** Bench Top Cooling Tower.

9.7.- HEAT EXCHANGE
- **TICC** Computer Controlled Heat Exchangers Training System: **(It uses SCADA System).**
  - **TIUS** Base Service Unit. (Common for available Heat Exchangers type "TI").
  Available Heat Exchangers: (computer controlled)
  - **TITC** Concentric Tube Heat Exchanger.
  - **TIPL** Plate Heat Exchanger.
  - **TICT** Shell & Tube Heat Exchanger.
  - **TIVE** Jacketed Vessel Heat Exchanger.
  - **TIVS** Coil Vessel Heat Exchanger.
  - **TIFT** Turbulent Flow Heat Exchanger.
- **TICB** Heat Exchangers Training System:
  - **TIUSB** Base Service Unit. (Common for available Heat Exchangers type "TI..B").
  Available Heat Exchangers:
  - **TITCB** Concentric Tube Heat Exchanger.
  - **TIPLB** Plate Heat Exchanger.
  - **TICTB** Shell & Tube Heat Exchanger.
  - **TIVEB** Jacketed Vessel Heat Exchanger.
  - **TIVSB** Coil Vessel Heat Exchanger.
  - **TIFTB** Turbulent Flow Heat Exchanger.

9.8.- HEAT TRANSFER (Basic)
- **TSTCC** Computer Controlled Heat Transfer Series: **(It uses SCADA System).**
  - **TSTCC/CIB.** Control Interface for Heat Transfer Series. (Common for available modules type "TXT").
  Available Modules: (computer controlled)
  - **TXC/CL** Linear Heat Conduction Module.
  - **TXC/CR** Radial Heat Conduction Module.
  - **TXC/RC** Radiation Heat Conduction Module.
  - **TXC/CC** Combined Free and Forced Convection and Radiation Module.
  - **TXC/SE** Extended Surface Heat Transfer Module.
  - **TXC/ER** Radiation Errors in Temperature Measurement Module.
  - **TXC/EI** Unsteady State Heat Transfer Module.
  - **TXC/LG** Thermal Conductivity of Liquid and Gas Module.
  - **TXC/FF** Free and Forced Convection Heat Transfer Module.
  - **TXC/TE** 3 Axis Heat Transfer Module.
  - **TXC/MM** Metal to Metal Heat Transfer Module.
  - **TXC/TC** Ceramic Heat Transfer Module.
  - **TXC/TI** Isolated Material Heat Transfer Module.
- **TSTCB** Heat Transfer Series:
  Available Modules:
  - **TXC/CLB** Linear Heat Conduction Module.
  - **TXC/CRB** Radial Heat Conduction Module.
  - **TXC/RCB** Radiation Heat Conduction Module.
  - **TXC/CCB** Combined Free and Forced Convection and Radiation Module.
  - **TXC/SEB** Extended Surface Heat Transfer Module.
  - **TXC/ERB** Radiation Errors in Temperature Measurement Module.
  - **TXC/EIB** Unsteady State Heat Transfer Module.
  - **TXC/LGB** Thermal Conductivity of Liquid and Gas Module.
  - **TXC/FFB** Free and Forced Convection Heat Transfer Module.
  - **TXC/TEB** 3 Axis Heat Transfer Module.
  - **TXC/MMB** Metal to Metal Heat Transfer Module.
  - **TXC/TCB** Ceramic Heat Transfer Module.
  - **TXC/TIB** Isolated Material Heat Transfer Module.

9.9.- HEAT TRANSFER (General)

- **TRTC**   Computer Controlled Thermal Radiation Unit. **(It uses SCADA System).**

- **TMT**   Temperature Measurement Unit.

- **TTLFC**   Computer Controlled Fluidisation and Fluid Bed Heat Transfer Unit. **(It uses SCADA System).**

- **TTLFB**   Fluidisation and Fluid Bed Heat Transfer Unit.

- **TCEC**   Computer Controlled Boiling Heat Transfer Unit. **(It uses SCADA System).**

- **TCEB**   Boiling Heat Transfer Unit.

- **TCCC**   Computer Controlled Heat Conduction Unit. **(It uses SCADA System).**

- **TCLGC**   Computer Controlled Thermal Conductivity of Liquids and Gases Unit. **(It uses SCADA System).**

- **TCPGC**   Computer Controlled Film and Dropwise Condensation Unit. **(It uses SCADA System).**

- **TCLFC**   Computer Controlled Free and Forced Convection Heat Transfer Unit. **(It uses SCADA System).**

- **TIFCC**   Computer Controlled Cross Flow Heat Exchanger. **(It uses SCADA System).**

- **TCMC**   Computer Controlled Thermal Conductivity of Building Materials Unit **(It uses SCADA System).**

9.10.- HEAT TRANSFER (Special)

- **TFLVC**   Computer Controlled Laminar/Viscous Flow Heat Transfer Unit. **(It uses SCADA System).**

- **TFLVB**   Laminar/Viscous Flow Heat Transfer Unit.

- **TIVAC**   Computer Controlled Steam to Water Heat Exchanger. **(It uses SCADA System).**

- **TFEC**   Computer Controlled Flow Boiling Demonstration Unit. **(It uses SCADA System).**

- **TRLC**   Computer Controlled Recycle Loops Unit. **(It uses SCADA System).**

- **TSPC**   Computer Controlled Saturation Pressure Unit. **(It uses SCADA System).**

- **TEPGC**   Computer Controlled Expansion Processes of a Perfect Gas Unit. **(It uses SCADA System).**

- **TFUC**   Computer Controlled Batch Filtration Unit. **(It uses SCADA System).**

- **TCFUC**   Computer Controlled Continuous Filtration Unit. **(It uses SCADA System).**

9.11.- NOZZLES & STEAM

- **TFTC**   Computer Controlled Nozzle Performance Test Unit. **(It uses SCADA System).**

- **TPT**   Nozzle Pressure Distribution Unit.

- **TGV**   Steam Generator.

- **TGV-6KW**   Steam Generator (6KW).

9.12.- COMBUSTION **(It uses SCADA System)**

- **TVCC**   Computer Controlled Combustion Laboratory Unit.

- **TVPLC**   Computer Controlled Flame Propagation and Stability Unit.

10.- PROCESS CONTROL

10.1.- PROCESS CONTROL. FUNDAMENTALS **(It uses SCADA System)**

- **UCP**   Computer Controlled Process Control System(with electronic control valve):
  - **UCP-UB**   Base Unit. (Common for all Sets for process control type "UCP").
  - **Sets** (sensor and elements + computer control software) **used in the base unit:**
  - **UCP-T**   Set for Temperature Process Control.
  - **UCP-C**   Set for Flow Process Control.
  - **UCP-N**   Set for Level Process Control.
  - **UCP-PA**   Set for Pressure Process Control.
  - **UCP-PH**   Set for pH Process Control.
  - **UCP-CT**   Set for Conductivity and TDS (Total Dissolved Solids)Process Control.

- **UCPCN**   Computer Controlled Process Control System (with pneumatic control valve):
  - **UCPCN-UB** Base Unit. (Common for all Sets for process control type "UCPCN").
  - **Sets** (sensor and elements + computer control software) **used in the base unit:**
  - **UCPCN-T**   Set for Temperature Process Control.
  - **UCPCN-C**   Set for Flow Process Control.
  - **UCPCN-N**   Set for Level Process Control.
  - **UCPCN-PA** Set for Pressure Process Control.
  - **UCPCN-PH** Set for pH Process Control.
  - **UCPCN-CT** Set for Conductivity and TDS (Total Dissolved Solids) Process Control.

- **UCPCV**   Computer Controlled Process Control System (with speed controller):
  - **UCPCV-UB** Base Unit. (Common for all Sets for process control type "UCPCV").
  - **Sets** (sensor and elements + computer control software) **used in the base unit:**
  - **UCPCV-T**   Set for Temperature Process Control.
  - **UCPCV-C**   Set for Flow Process Control.
  - **UCPCV-N**   Set for Level Process Control.
  - **UCPCV-PA** Set for Pressure Process Control.
  - **UCPCV-PH** Set for pH Process Control.
  - **UCPCV-CT** Set for Conductivity and TDS (Total Dissolved Solids) Process Control.

- **UCPCNCV** Computer Controlled Process Control System (with electronic control valve + pneumatic control valve + speed controller):
  - **UCPCNCV-UB** Base Unit. (Common for all Sets for process control type "UCPCNCV").
  - **Sets** (sensor and elements + computer control software) **used in the base unit:**
  - **UCPCNCV-T**   Set for Temperature Process Control.
  - **UCPCNCV-C**   Set for Flow Process Control.
  - **UCPCNCV-N**   Set for Level Process Control.
  - **UCPCNCV-PA** Set for Pressure Process Control.
  - **UCPCNCV-PH** Set for pH Process Control.
  - **UCPCNCV-CT** Set for Conductivity and TDS (Total Dissolved Solids) Process Control.

- **UCP-P**   Computer Controlled Process Control Unit for the study of Pressure (Air).
- **UCPMB**   Process Control Modular Basic System.
- **CECI**   Industrial Controllers Trainer.
- **CRCI**   Industrial Controllers Networking.
- **CEAB**   Trainer for Field Bus Applications.
- **CEAC**   Controller Tuning Trainer.

10.2.- INDUSTRIAL PROCESS CONTROL **(It uses SCADA System).**

- **CPIC**   Computer Controlled Process Control Plant with Industrial Instrumentation and Service Module. (Flow, Temperature, Level and Pressure).
- **CPIC-C**   Computer Controlled Process Control Plant with Industrial Instrumentation and Service Module. (only Flow).
- **CPIC-T**   Computer Controlled Process Control Plant with Industrial Instrumentation and Service Module. (only Temperature).
- **CPIC-N**   Computer Controlled Process Control Plant with Industrial Instrumentation and Service Module. (only Level).
- **CPIC-P**   Computer Controlled Process Control Plant with Industrial Instrumentation and Service Module. (only Pressure).

11.- CHEMICAL ENGINEERING

11.1.- CHEMICAL ENGINEERING (Basic)

- **CAGC**   Computer Controlled Gas Absorption Column. **(It uses SCADA System).**

- **CAG**   Gas Absorption Column.

- **UELLC**   Computer Controlled Liquid-Liquid Extraction Unit. **(It uses SCADA System).**

- **UELL**   Liquid-Liquid Extraction Unit.

- **UDCC**   Computer Controlled Continuous Distillation Unit. **(It uses SCADA System).**

- **UDCB**   Continuous Distillation Unit.

- **UDDC**   Computer Controlled Batch Distillation Unit. **(It uses SCADA System).**

- **UDDB**   Batch Distillation Unit.

11.2.- CHEMICAL ENGINEERING (General)

- **UESLC**   Computer Controlled Solid-Liquid Extraction Unit. **(It uses SCADA System).**

- **UESLB**   Solid-Liquid Extraction Unit.

- **EPAC**   Computer Controlled Rising Film Evaporator. **(It uses SCADA System).**

- **EPAB**   Rising Film Evaporator.

- **EPDC**   Computer Controlled Falling Film Evaporator. **(It uses SCADA System).**

- **EPDB**   Falling Film Evaporator.

- **EDPAC**   Computer Controlled Double Effect Rising Film Evaporator. **(It uses SCADA System).**

- **EDPAB**   Double Effect Rising Film Evaporator.

- **EDPDC**   Computer Controlled Double Effect Falling Film Evaporator. **(It uses SCADA System).**

- **EDPDB**   Double Effect Falling Film Evaporator.

- **CAPC**   Computer Controlled Wetted Wall Gas Absorption Column. **(It uses SCADA System).**

- **QDTLC**   Computer Controlled Liquid Mass Transfer and Diffusion Coefficient Unit. **(It uses SCADA System).**

- **QDTL**   Liquid Mass Transfer and Diffusion Coefficient Unit.

- **QDTGC**   Computer Controlled Gaseous Mass Transfer and Diffusion Coefficient Unit. **(It uses SCADA System).**

- **QDTG**   Gaseous Mass Transfer and Diffusion Coefficient Unit.

- **QCCC**   Computer Controlled Cracking Column. **(It uses SCADA System).**

- **BPPC**   Computer Controlled Teaching and Research Biodiesel Pilot Plant. **(It uses SCADA System).**

- **QUCC**   Computer Controlled Crystallisation Unit. **(It uses SCADA System).**

11.3.- CHEMICAL REACTORS

- **QRQC**   Computer Controlled Chemical Reactors Training System: **(It uses SCADA System).**

    ● **QRUBI**   Base Service Unit. (Common for available Reactors type "QR").

    Available Reactors: (computer controlled)

    ● **QRIA**   Isothermal Reactor with Stirrer.

    ● **QRIA/D**   Isothermal Reactor with Distillation.

    ● **QRFT**   Tubular Flow Reactor.

    ● **QRAD**   Adiabatic and Isothermal Reactor.

    ● **QRSA**   Reactors with Stirrer in Series.

- **QRQB**   Chemical Reactors Training System:

    ● **QRUBIB**   Base Service Unit.(Common for available Reactors type "QR..B").

    Available Reactors:

    ● **QRIAB**   Isothermal Reactor with Stirrer.

    ● **QRIA/DB**   Isothermal Reactor with Distillation.

    ● **QRFTB**   Tubular Flow Reactor.

    ● **QRADB**   Adiabatic and Isothermal Reactor.

    ● **QRSAB**   Reactors with Stirrer in Series.

11.4.- CHEMICAL PROCESS

- **EMLS**   Liquid/Solid Mixing Unit.

- **EEC**   Corrosion Study Unit.

- **ESED**   Sedimentation Study Unit.

- **LFFC**   Computer Controlled Fixed and Fluidised Bed Unit. **(It uses SCADA System).**

- **LFF**   Fixed and Fluidised Bed Unit.

- **QEDC**   Computer Controlled Batch Solvent Extraction and Desolventising Unit. **(It uses SCADA System).**

- **QMS**   Solids Handling Study Unit.

- **TFUC**   Computer Controlled Batch Filtration Unit. **(It uses SCADA System).**

- **TCFUC**   Computer Controlled Continuous Filtration Unit. **(It uses SCADA System).**

11.5.- CHEMICAL PROCESS (Agronomical Industry)

- **SBANC**   Computer Controlled Tray Drier. **(It uses SCADA System)**

11.6.- CHEMICAL PROCESS (Special) **(It uses SCADA System)**

- **EPIRC**   Computer Controlled Pyrolysis Unit.

- **PLGC**   Computer Controlled Gas Washing Process Plant.

- **PPDAC**   Computer Controlled Water Demineralization and Processing Plant.

12.- FOOD & WATER TECHNOLOGIES

12.1.- **FOOD TECHNOLOGY (Basic)** (It uses SCADA system)

- **PADC**   Computer Controlled Teaching Autonomous Pasteurization Unit.
- **MINI-LAB** Laboratory Homogeniser.
- **SBANC**   Computer Controlled Tray Drier.
- **AEHC**   Computer Controlled Hydrogenation Unit.
- **AEDC**   Computer Controlled Deodorising Unit.
- **TFDC**   Computer Controlled Teaching Frigorific Tank.
- **EDLC**   Computer Controlled Teaching Machine for Putting in Plastic Packing Liquids.
- **EDSC**   Computer Controlled Teaching Machine for Putting into a container Solids.
- **ROUC**   Computer Controlled Reverse Osmosis/Ultrafiltration Unit.
- **VPMC**   Computer Controlled Multipurpose Processing Vessel.
- **TPCC**   Computer Controlled Contact Plate Freezer.

12.2.- **FOOD TECHNOLOGY (Milk)**

- **DSNC**   Computer Controlled Teaching Cream Separator. **(It uses SCADA System).**
- **DSN**   Teaching Cream Separator.
- **EMANC**   Computer Controlled Butter Maker Teaching Unit. **(It uses SCADA System).**
- **EMAN**   Butter Maker Teaching Unit.
- **AUHTC**   Computer Controlled UHT Unit. **(It uses SCADA System).**
- **CCDC**   Computer Controlled Teaching Curdled Tank.**(It uses SCADA System).**
- **PVQC**   Computer Controlled Teaching Cheese Vertical Press. **(It uses SCADA System).**
- **IYDC**   Computer Controlled Teaching Yogurt Incubator. **(It uses SCADA System).**
- **RDC**   Computer Controlled Teaching Cottage Cheese Maker. **(It uses SCADA System).**
- **FQDC**   Computer Controlled Teaching Cheese Melter. **(It uses SCADA System).**

12.3.- **FOOD TECHNOLOGY (Oil)**

- **PACC**   Computer Controlled Continuous Cycle Oil Production Plant. **(It uses SCADA System).**

12.4.- **FOOD TECHNOLOGY (Pilot Plants)** (It uses ESN System)

- **LE00**   Process Plant for Dairy Products with Scada-Net System "ESN".
- **CA00**   Process Plant for Meat with Scada-Net System "ESN".
- **CI00**   Process Plant for Citrus Fruits with Scada-Net System "ESN".
- **FR00**   Process Plant for Fruits with Scada-Net System "ESN".
- **VE00**   Process Plant for Vegetables with Scada-Net System "ESN".
- **AS00**   Process Plant for Seeds Oil with Scada-Net System "ESN".
- **AC00**   Process Plant for Olive Oil with Scada-Net System "ESN".
- **TO00**   Process Plant for Tomatoes with Scada-Net System "ESN".
- **UV00**   Process Plant for Grapes with Scada-Net System "ESN".
- **CE00**   Process Plant for Cereals with Scada-Net System "ESN".

12.5.- CLEAN WATER PROCESS

- **BL-6**   Water Demineralizer.
- **DESMID** Ion Exchange Demineralizer.

13.- ENVIRONMENT

13.1.- WATER HANDLING

- **ESHC**(4x2m) Computer Controlled Hydrologic Systems, Rain Simulator and Irrigation Systems Unit (4x2m). **(It uses SCADA System).**
- **ESHC**(2x1m) Computer Controlled Hydrologic Systems, Rain Simulator and Irrigation Systems Unit (2x1m). **(It uses SCADA System).**
- **ESH**(2x1m) Hydrologic Systems Rain Simulator and Irrigation Systems Unit (2x1m).
- **PAHSC**   Computer Controlled Soil Moisture Suction Sand Unit. **(It uses SCADA System).**
- **PAHS**   Soil Moisture Suction Sand Unit.
- **PL**   Demonstration Lysimeter.
- **PPD**   Drain Permeameter.
- **PDFDC**   Computer Controlled Drainage and Seepage Tank. **(It uses SCADA System).**
- **PDFD**   Drainage and Seepage Tank.
- **PEIF**   Filterability Index Unit.
- **PDSC**   Computer Controlled Sedimentation Tank. **(It uses SCADA System).**
- **PDS**   Sedimentation Tank.
- **PEFP**   Permeability/Fluidisation Studies Unit.

13.2.- WATER TREATMENT

- **EFLPC**   Computer Controlled Deep Bed Filter Unit. **(It uses SCADA System).**
- **EFLP**   Deep Bed Filter Unit.
- **EII**   Ion Exchange Unit.
- **PDAC**   Computer Controlled Aerobic Digester. **(It uses SCADA System).**
- **PDA**   Aerobic Digester.
- **PDANC**   Computer Controlled Anaerobic Digester.**(It uses SCADA System).**
- **PDAN**   Anaerobic Digester.
- **PEFC**   Computer Controlled Flocculation Test Unit. **(It uses SCADA system).**
- **PEF**   Flocculation Test Unit.
- **PEAIC**   Computer Controlled Aeration Unit. **(It uses SCADA system).**
- **PEAI**   Aeration Unit.
- **ROUC**   Computer Controlled Reverse Osmosis/Ultrafiltration Unit. **(It uses SCADA System).**

13.3.- POLLUTION (Ground)

- **ECASC**   Computer Controlled Subterranean Water Pollution Unit. **(It uses SCADA System)**

Systems

Physics:
- **SE. Secondary Education.**
- **PL. Physics Laboratory.**

Process and Control:
- **PCMTC. Process Control and Maintenance Center.**
- **RCPCL. Regulation, Control and Process Control Laboratory.**
- **RPCTC. Refinery and Process Control Laboratory:**
    - **RPCTC-RF**   Refinery Basic Process Module.
    - **RPCTC-PC**   Process Control Module.
    - **RPCTC- EE**   Electricity & Electronics Module.
    - **RPCTC-HT**   Heat Transfer Module.
    - **RPCTC-FL**   Fluids Module.

Industry:
- **PPTC. Power Plants Training Center.**
- **FTPP. Food Technology Pilots Plants:**
    - **LE00**   Process Plant for Dairy Products with Scada-Net System "ESN".
    - **CA00**   Process Plant for Meat with Scada-Net System "ESN".
    - **CI00**   Process Plant for Citrus Fruits with Scada-Net System "ESN".
    - **FR00**   Process Plant for Fruits with Scada-Net System "ESN".
    - **VE00**   Process Plant for Vegetables with Scada-Net System "ESN".
    - **AS00**   Process Plant for Seeds Oil with Scada-Net System "ESN".
    - **AC00**   Process Plant for Olive Oil with Scada-Net System "ESN".
    - **TO00**   Process Plant for Tomatoes with Scada-Net System "ESN".
    - **UV00**   Process Plant for Grapes with Scada-Net System "ESN".
    - **CE00**   Process Plant for Cereals with Scada-Net System "ESN".

Scada: (Scada and Scada-Net System):
- **TPDL. Technical Professional Distance Learning.**
- **Mini ESN. Mini EDIBON Scada-Net** (for many units and many students).
- **ESC.EDIBON Scada-Net:** (for many units and many students).
    - **ESN-EE.** Electricity & Electronics Laboratory.
    - **ESN-AR.** Air Conditioning & Refrigeration Laboratory.
    - **ESN-HT.** Heat Transfer Laboratory.
    - **ESN-PC.** Process Control Laboratory.
    - **ESN-CE.** Chemical Engineering Laboratory.
    - **ESN-EN.** Environment Laboratory.
    - **ESN-FL .** Fluids Laboratory.

Special Training Center:
- **NTTSC. New Technology Technical Skills Center.**
- **TTTARC. Teacher Technical Training and Applied Research Center.**
- **MU.Mobile Units.**

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