

Renewable Energy lab Funded by Erasmus projects and AAST



17/10/2020

**Wind Engineering Skills in
Egypt and Tunisia (WESET)**

WIND ENERGY MODULAR TRAINER WITH CONNECTION TO MAINS

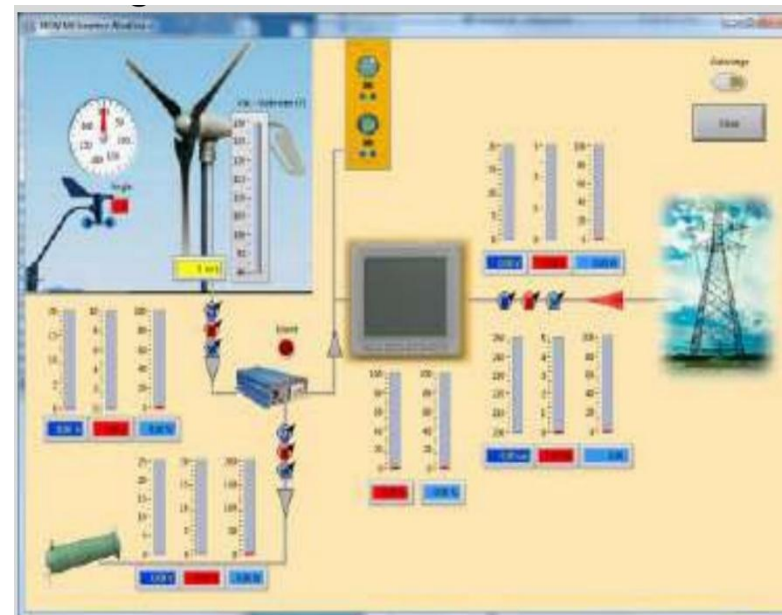
- Didactic system for the study of the generation of electric energy from a wind turbine and its inlet in the mains network.
- The device includes a stepper motor kit to drive the wind generator in absence of wind.
- Complete with connecting cables, experiment manual and software for data acquisition and processing.



WIND ENERGY MODULAR TRAINER WITH CONNECTION TO MAINS

TECHNICAL SPECIFICATIONS

- A wind turbine, 400W, 12Vac.
- Anemometer and wind direction sensor mounted on a stand.
- A supporting frame for the modules.
- A braking resistance, 250 W, 3 Ohm.
- A load module. It includes two mains voltage lamps, dichroic 35W and LED 3W, with independent switches.
- A module for the measurement of: wind speed (m/s), wind direction (degrees), current up to 30V, $\pm 15A$ (two dc ammeters), voltage up to 30V and power up to 1000W.
- Grid tie inverter.
- An energy measurement module.



- A differential magneto-thermal switch.
- A network distributor.
- A motor kit for driving the wind turbine, composed of a stepper motor and a 300 W power supply.

WTF-B200 Wind Speed and Direction Anemometer

- Whole set of WTF-B200 wind vane anemometer includes WTF-B200 display, WFS-1 wind speed sensor, SC/FX wind direction sensor and cables.

Application

- Cranes
- Weather
- Agriculture
- Hydraulic and Hydroelectricity
- Construction
- Education



FERVE F-814 battery and Alternator Tester 12 V

- Intakes for generator and battery discharge Tester
- Discharge of 250 for 10 seconds
- Digital indicator with hundredths of a Volt
- For lead acid batteries, with a capacity between 32 and 180 Ah



Auto Meter SB-300 Intelligent Handheld Battery Tester

- Tests flooded, deep cycle, and AGM batteries with CCA range of 100-1600 - also detects discharged batteries, bad cells, and has built in reverse polarity protection.
- This tester applies a true 40 amp load to the battery in order to simulate real world operating conditions consistent with BCI (Battery Council International) testing standards.
- Battery test results include: Measured true CCA, voltage and percent of charge, and the battery's state of health (good, near end of life, or bad).
- Automatically stores the last 100 tests in memory.
- 30" - 16 gauge leads with professional grade clamps that are easily field serviceable.



MPR-47s New-Generation Network Analyzers

NEW



MPR-4X Series New-Generation Network Analyzers

With their compact design and 45mm depth, MPR-4X series new generation network analyzers occupy less space in the panels and have a wide range of operating voltage (45-265 VAC/DC). In addition up to 8 MB internal memory, they offer wide I/O solutions with their replaceable modular structure based on customer requirements and areas of application.

MPR-4X Series offer a wide range of analog and digital inputs/outputs and relay outputs with their I/O modules.

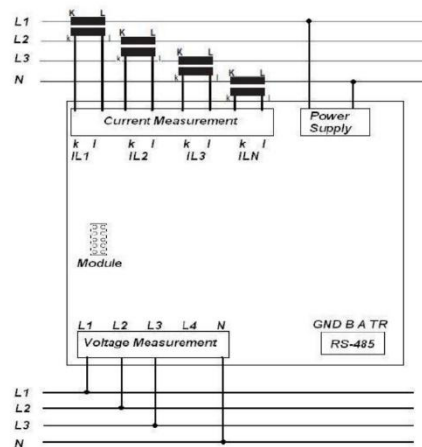
Remote Monitoring Software:

With the energy management software developed by ENTES, energy consumption and quality can be monitored in real time by reading the values measured by devices. As a result, comprehensive energy monitoring, data storage, optimum energy consumption control with the analysis of stored data, improvements in energy costs, and sustainable goals for energy systems are accomplished.



MPR-47s New-Generation Network Analyzers

PRODUCT SELECTION TABLE																					
Product Code	Dimensions / mm	3xV, 3xI, Frequency, W, VA, P, Q, S, kWh, kVAh, Demand, Max., Min. Cos. I neutral	THD-I	THD-V	Harmonics 1-51 st	RS-485	Digital Input	Digital Output	AI mA/V	AO mA	AO V	Relay Output	Pulse Output	Real Time Clock	Memory	Voltage/Current Unbalances	Pulse Counter	Operating Hours Meter	Alarm	Event Logs	Outage Records
MPR-45	96x96	●					*	*	*	*	*	*	*	●				●	*	*	●
MPR-45S	96x96	●				●	*	*	*	*	*	*	*	●	8MB			●	●	●	●
MPR-46	96x96	●	●	●			*	*	*	*	*	*	*	●			*	●	*	*	●
MPR-46S	96x96	●	●	●		●	*	*	*	*	*	*	*	●	8MB		*	●	●	●	●
MPR-47S	96x96	●	●	●	●	●	*	*	*	*	*	*	*	●	8MB	●	*	●	●	●	●

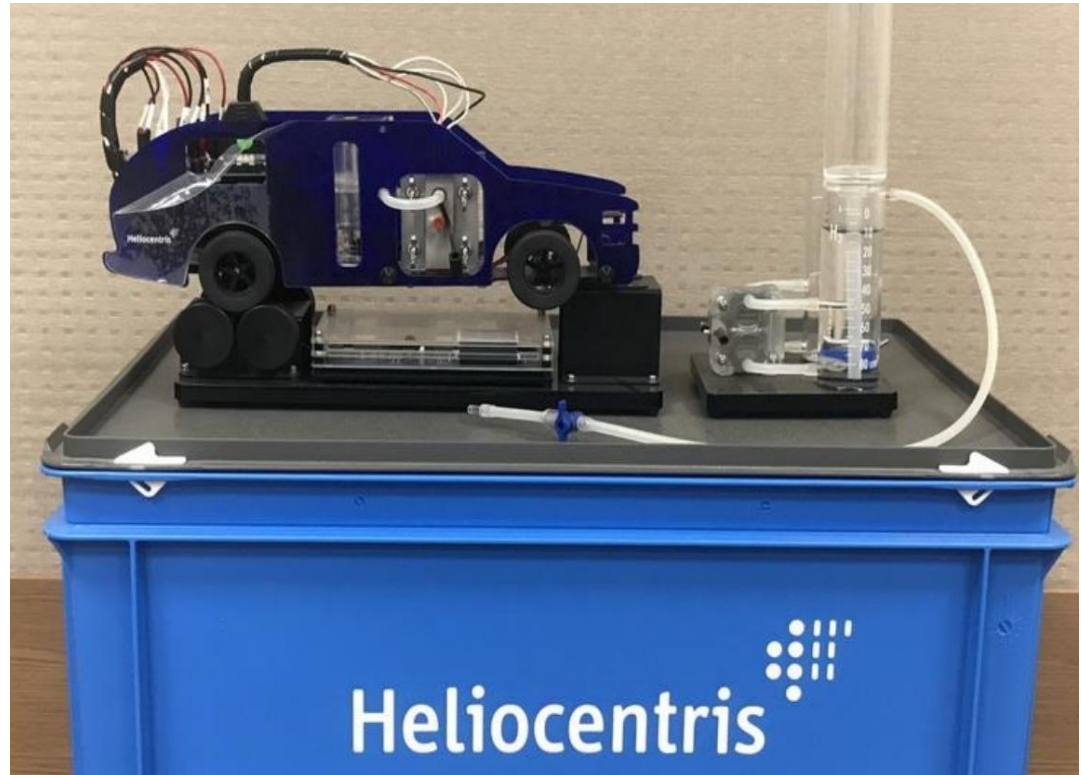


HyDrive Electric Hybrid Vehicle Trainer. (HELIOCENTRIS)

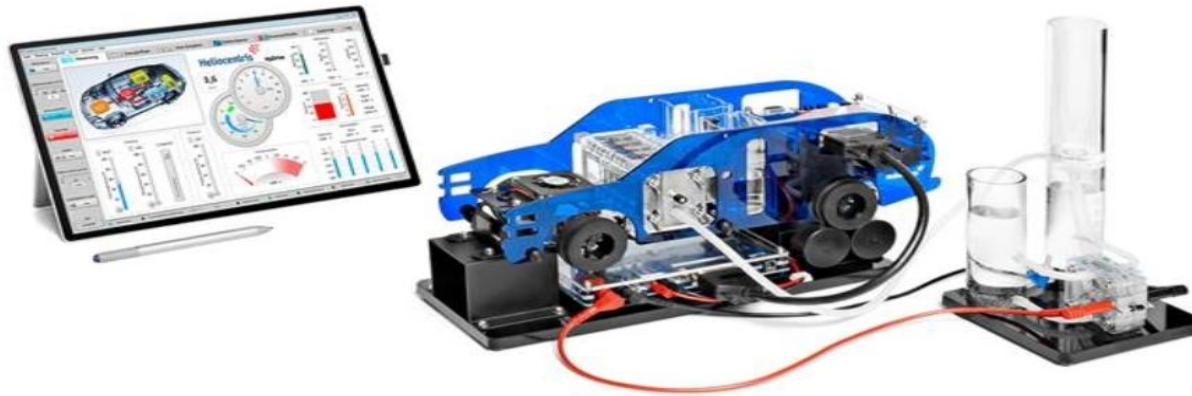
The modular set-up allow users to examine separate subcomponents or the complete hybrid system

Components

- Fuel Cell Stack
- H₂ Gas Storages (2 pieces)
- Fan
- Supercapacitor
- Hydrogen Filling Station
- Test Bench Controlle
- Energy Management Board



HyDrive Electric Hybrid Vehicle Trainer. (HELIOCENTRIS)



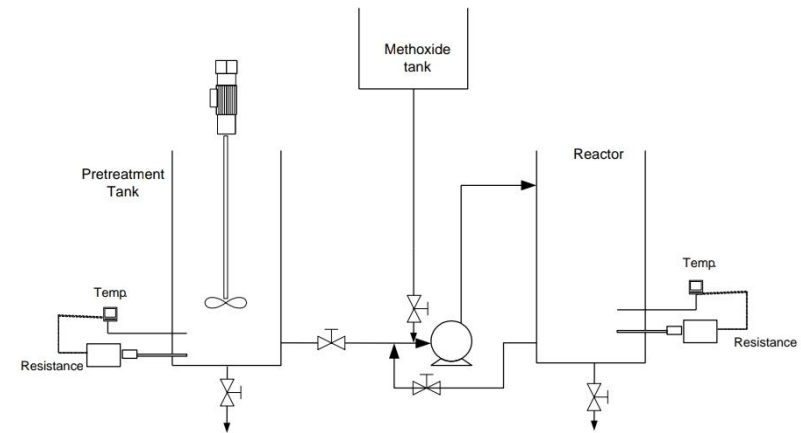
Experiments:-

- The charge and discharge characteristics of a supercapacitor
- The characteristic curve of a fuel cell and its maximum power point
- The relationship between the fuel cell performance and air supply
- The basic equation of motion and the conversion of electrical to mechanical power
- The characteristic curve and energy efficiency of an electrolyzer
- FCEVs in practice: the recuperation of braking energy
- Constructing and testing a hybrid system

PLANT FOR THE PRODUCTION OF BIODIESEL



DL BIO-10



List of Experiments

Biodiesel synthesis and determination of the density of the product

Experiment 1 - Biodiesel synthesis from unused and used sunflower oil. Using methanol and sodium hydroxide.

Experiment 2 - Biodiesel synthesis from unused and used sunflower oil. Using methanol and potassium hydroxide.

Computer Controlled Thermal Solar Energy Unit, with SCADA

EXERCISES AND PRACTICAL POSSIBILITIES TO BE DONE:

- 1.- Study of the thermosiphon operation.
 - 2.- Study of the luminosity profile of the lamps.
 - 3.- Study of the efficiency of the solar panel.
 - 4.- Study of the influence of the tilt angle of the lamps panel on the unit efficiency.
 - 5.- Study of relation between the flow and the temperature.
 - 6.- Study of energy balance of the solar collector.
 - 7.- Study of energy balance of the accumulator tank.
 - 8.- Determination of the experimental efficiency.
 - 9.- Study of the influence of the angle of incidence on the temperature.
- Additional practical possibilities:
- 10.-Sensors calibration.
 - 11.-Flowmeter calibration.



Computer Controlled Thermal Solar Energy Unit, with SCADA

Other possibilities to be done with this Unit:

12.-Many students view results simultaneously.

To view all results in real time in the classroom by means of a projector or an electronic whiteboard.

13.-Open Control, Multicontrol and Real Time Control. This unit allows intrinsically and/or extrinsically to change the span, gains; proportional, integral, derivative parameters; etc, in real time.

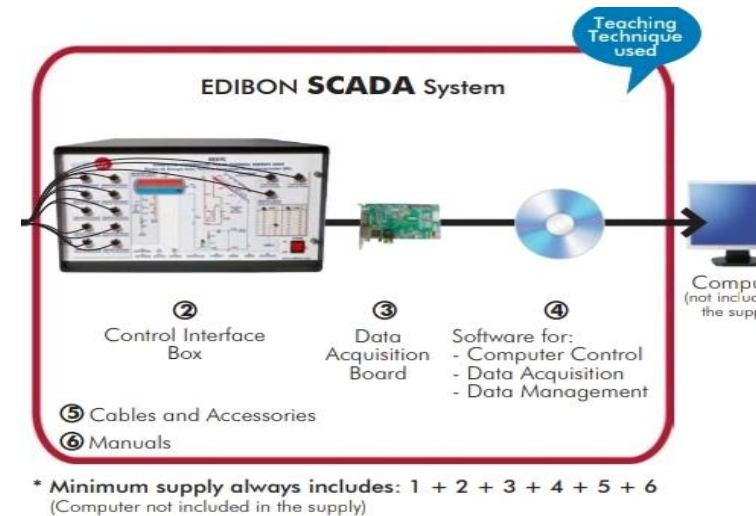
14.-The Computer Control System with SCADA allows a real industrial simulation.

15.-This unit is totally safe as uses mechanical, electrical/electronic, and software safety devices.

16.-This unit can be used for doing applied research.

17.-This unit can be used for giving training courses to Industries even to other Technical Education Institutions.

18.-Control of the EESTC unit process through the control interface box without the computer.



Air-Handling Unit



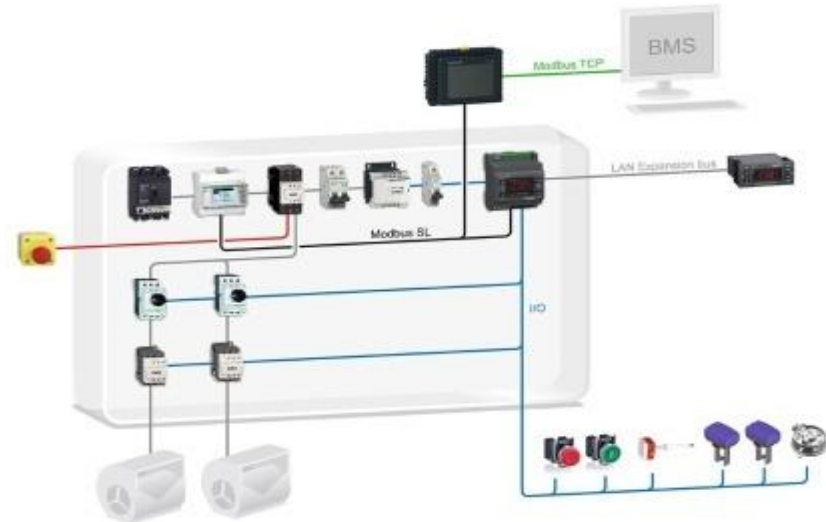
Complete solution with full features for your energy efficient AHU, connected to a Building Management System.

Air-Handling Unit Solution

Solution for simple or compact air handling units, heat recovery units and ventilation units.

Solution

Solution based on the Modicon M171 optimized logic controller, which allows you to build your equipment for simple and compact machines.



Benefits

Solution can be tailored to your needs with the Modicon M171 optimized logic controller: in 24V AC/DC and 110-230VAC.

Compact controller reduces cabinet size in DIN package or flush mounting.

Precision Weather Station VANTAGE PRO2. (DAVIS) ETL3000/ETLONE Multi-Component Air Quality Monitor.

Wireless Vantage Pro2™ with Standard Radiation Shield

A weather station with customizable features and robust performance: perfect for the serious weather watcher.



50 kW Solar Power Plant (On-Grid) with Weather Station. (ABB)

- The station learn student how solar panels work ant its configuration and components for
- on-grid
- Off-grid
- Hybrid



16/8/2020

Building Capacity of AASTMT
labs in Renewable Energy and

50 kW Solar Power Plant (On-Grid) with Weather Station. (ABB)

The productivity of the station can be monitoring with PC Monitoring Software (Aurora Vision) which can give us the states of the station the power right now in KW, energy generation in KWh and environmental from weather station like insolation/ irradiance, ambient temp/ cell temp and wind Direction/ wind speed all of this called the **plant viewer**.

plant viewer



Hybrid 10 kW PV Inverter. (InfiniSolar)

This hybrid PV inverter can provide power to connected by utilizing PV Power, utility and battery power.

Depending on different power situation, this hybrid inverter is designed to generate continuous power from PV solar modules (solar panels), battery, and the utility.

There are three operation modes: Grid-Tie with backup, Grid-Tie and Off-Grid.

