SOLAR PUMP TRAINER
DL WP-SOLAR-D

This image is for reference purposes only

The **DL WP-SOLAR-D** trainer is designed to demonstrate the use of a water pump from an underground water source, powered by a solar photovoltaic system. The latter can be powered directly by the solar panel or through the battery regulation system.

The **solar pump trainer** is composed of:

- Water Pumping System,
- Control Panel,
- Photovoltaic Solar Panel,
- Two Batteries.

The ***Water Pumping System*** includes:

- Two volumetric tanks of different sizes with water hoses and connections, mounted on an anodized aluminum stand that includes wheels to facilitate its mobility.
- A 67L sump tank simulating the underground water source.
- A 50L capacity transparent container acting as water reserve. A water tap simulates water consumption and returns water to the sump tank.
- Water pump 100W/24Vdc/4A capable of dry pumping, activated with a relay. It pumps water from the sump tank and fills the reserve water container. Includes a pressure switch for pump operation detection and signaling.
- No direct water connection is needed, closed circulation system.
- Both tanks have a graduated level scale in cm.

- A set of sensors monitors the status of the system such as:
  - Tank maximum level sensor,
  - Pipeline pressure sensor,
  - Pipeline pressure direct reading gauge,
  - Digital flow meter transducer for water input and output,
  - Reed level sensor for reserve tank,
  - Relay activated drain valve,
  - Motorized drain valve.

The ***Control Panel*** includes:

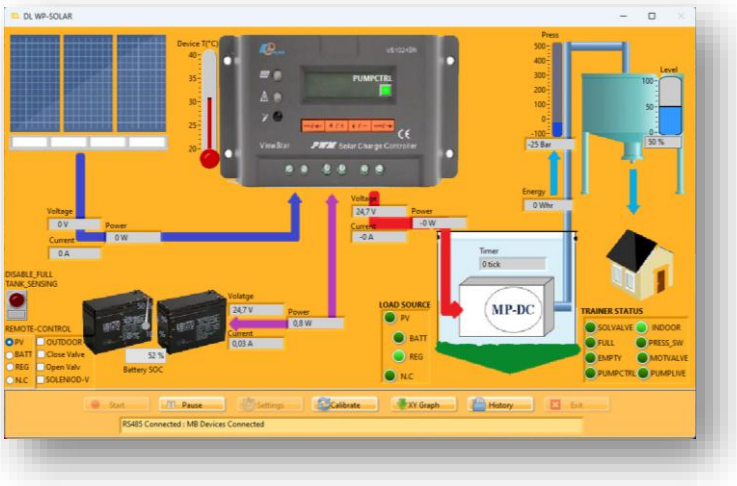
- 4mm terminals for PV panel, battery and pump.
- 24Vdc/5A regulator controls battery charging.
- Control Switches to control the system operation to select the power source for feeding the pump (panel, battery, regulator or manual operation).
- Multifunction instrument to measure DC Voltage (± 65Vdc), Current (± 20Adc) and power of PV panel, battery, and pump.
- Communication: Modbus RTU/RS485.
- Different test points are accessible through 2mm terminals for the sensors of the system (level sensors, flow sensors, pressure sensor, pressure switch, and drain valve).
- Separate protection breakers for pump (1P C4) and battery (1P C10).
- Integrated 24Vdc power supply to power the system from mains.

The ***Photovoltaic Solar Panel*** has the following features:

- 280W/24V Polycrystalline.
- Voltage at maximum power (V_{mp}): 32.4V.
- Current at maximum power (I_{mp}): 8.64A.
- Open circuit voltage (V_{oc}): 39.0V.
- Short circuit current (I_{sc}): 9.27A.

The ***Two Batteries*** with 12V/7Ah each, supply the pumping station when sunlight is absent.

The trainer is supplied with Computer Control, Data Acquisition and Data Management Software based on LabVIEW for performing the experiments.



Complete with cables and accessories for normal operation and detailed manual.

RENEWABLE ENERGIES

ACCESSORY (NOT INCLUDED):

DL SIMSUN

This module is suggested to provide suitable lighting for the photovoltaic solar panel for indoor use. The light can be manually adjusted or automatically controlled to allow performing experiments with different light intensities, therefore simulating the light conditions from dawn to twilight. Composed of 12 halogen lamps, 120W each.