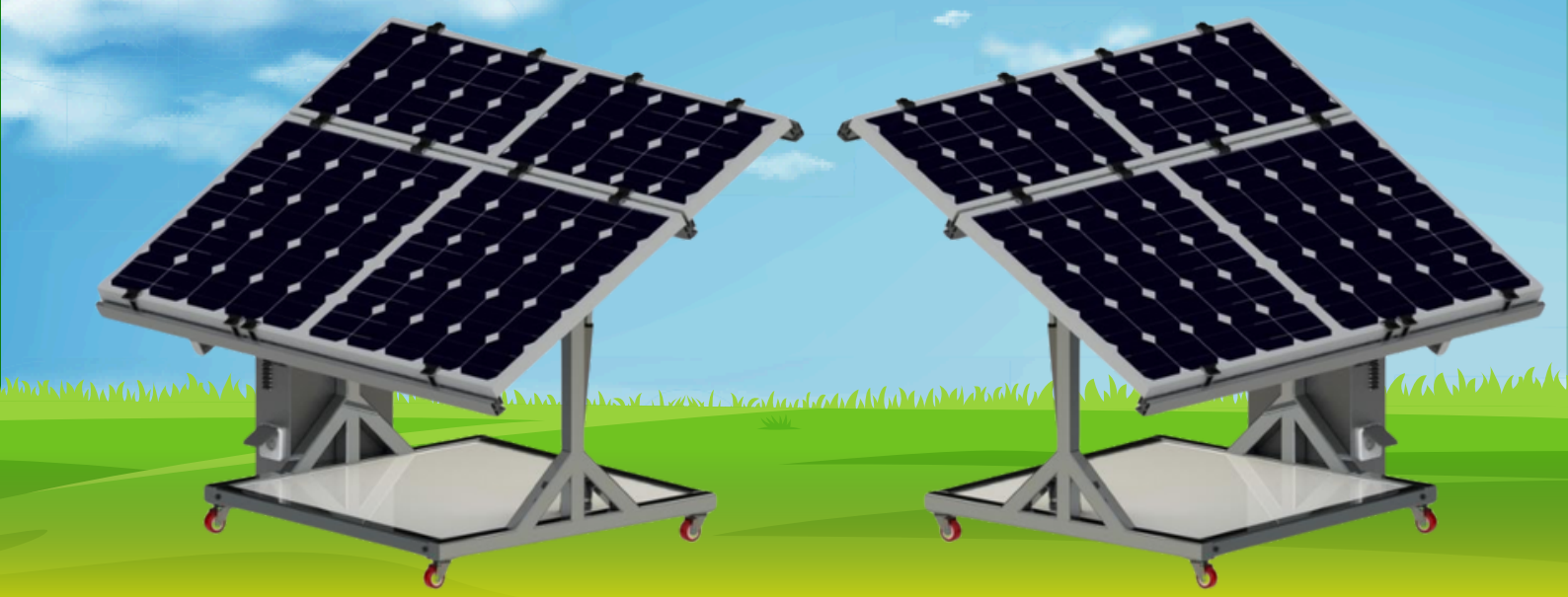
UMALO PLTS SIMULATOR



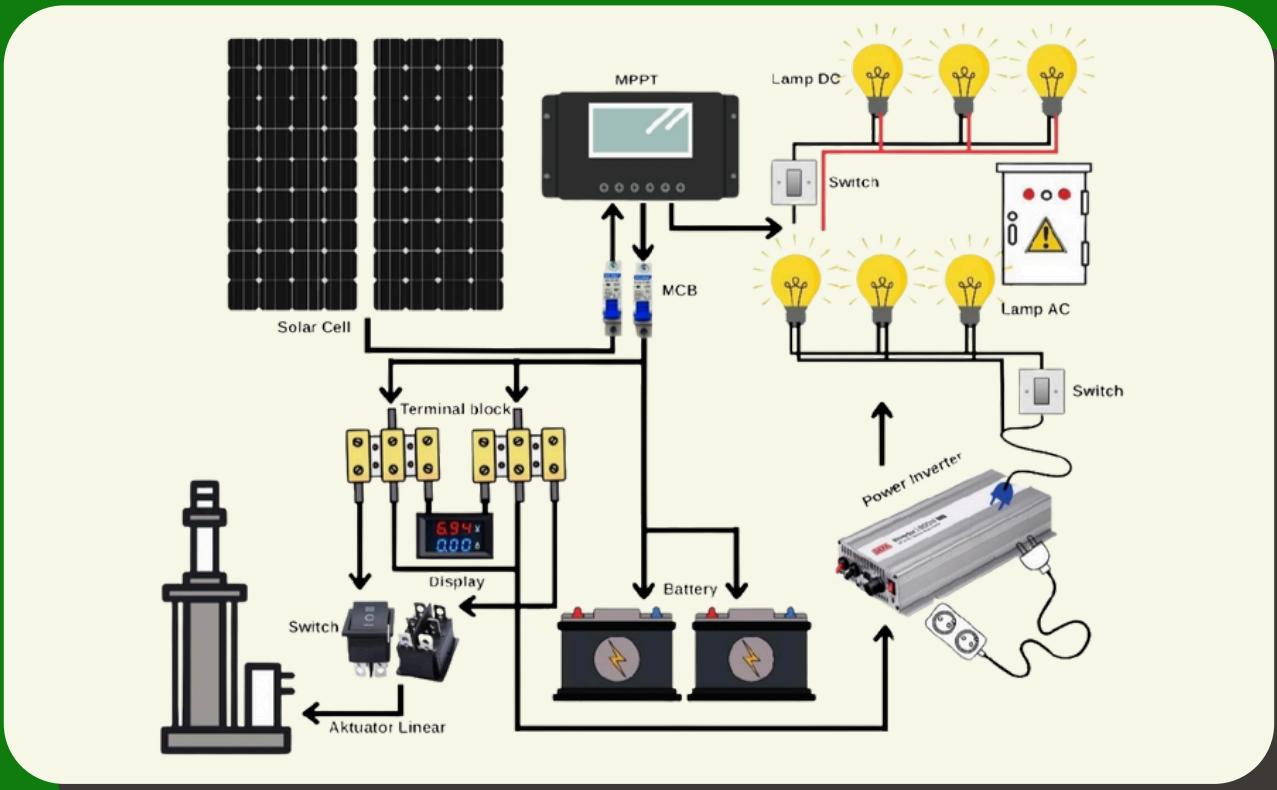
Manual Control

Practical Learning

Renewable Energy Education

Live Analysis

Umalo PLTS Simulator



UMALO PLTS Simulator is an interactive learning tool designed to introduce students to Solar Power Plants (PLTS). Using a manual linear actuator and solar tracking system, students can learn about:

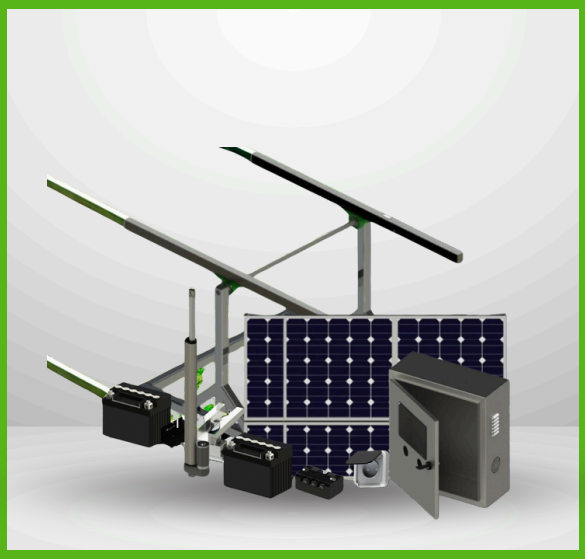
1. The working principles of solar power systems
2. Solar panel configuration
3. Real-time energy monitoring

Key Features

Manual Panel Tracking
Adjust the solar panel position manually for optimal efficiency

Series and Parallel Simulation
(Build your own panel and battery configurations!)

Digital Monitoring
(Track voltage and current directly from the display)



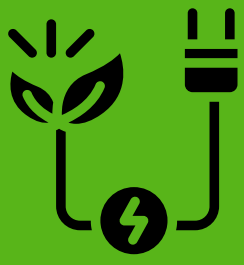
Real Industrial Components
(Featuring real MPPT, MCB, and inverter!)

LEARNING BENEFIT

Understand the concept of renewable energy

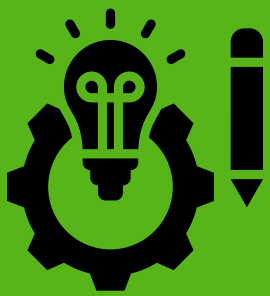
Develop technical skills & electrical measurement abilities

Increase environmental awareness



Get introduced to green technology from an early age

Be prepared for the future of energy challenges!



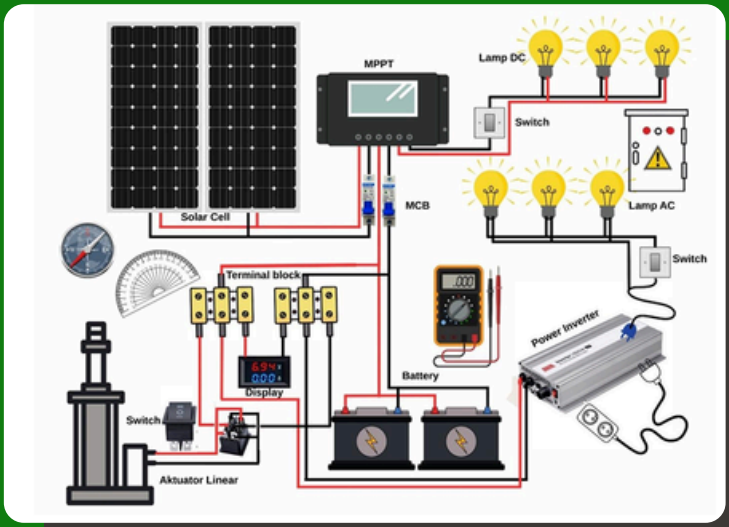
Learn through hands-on experience, not just theory!

One small step, a big change for the world!

General Specifications

Component	Brief Specification
Solar Panel	2 units of 30WP Solar Panels (SANKELUX) : • Voltage at Pmax (Vmp) – 12.5V • Current at Pmax (Imp) – 2.7A • Cell Technology - Mono
	2 units of 30WP Solar Panels (SANKELUX) : • Voltage at Pmax (Vmp) – 18.3V • Current at Pmax (Imp) – 3.2A • Cell Technology - Mono
Panel Configuration Simulation	Series System (4 Panels) : • Voltage : 18.3 + 18.3 + 12.5 + 12.5 + = 61.6 V • Current : Follows the lowest current = 2.7 A • Power : 61.6 × 2.7 = 166.32 W *(high potential loss)*
	Series System (4 Panels) : • Voltage : ≈ 12.5 V (follows 30 WP panel) • Current : 3.2 + 3.2 + 2.7 + 2.7 = 11.8 A • Power : 12.5 × 11.8 = 147.5 W (with panel mismatch loss)
MPPT Controller	• Real MPPT 20A Auto 12/24V • Epever Solar Charge Controller MPPT 20A Tracer 2210AN • Rated Current Charge: 20A • Rated Discharge Current: 20A • Battery Voltage Range: 8-32V • Max. PV Open Circuit Voltage: 100V • Max. PV Input Power: 260W/12V 520W/24V
Battery	VRLA 12V 33-35Ah
	Series System: 2 batteries of 12V 33Ah = 12V 66Ah
	Parallel System: 2 batteries of 12V 33Ah = 24V 33Ah
Inverter	500W DC-AC
Linear Actuator	12V Manual Control
Display	Digital Volt/Ampere
Measuring Tools	Multimeter, Compass, Protractor

How the UMALO PLTS Simulator Works



1

Capturing Sunlight
It all begins when the solar panel (solar cell) captures sunlight and converts it into direct current (DC) electricity, clean and renewable energy at its source.

2

Optimizing Energy with MPPT
The electricity doesn't go straight to the battery. First, it passes through the MPPT (Maximum Power Point Tracker), which ensures that the power input is always efficient and optimal.

3

System Protection with MCB
Before reaching the battery, the current goes through the MCB (Miniature Circuit Breaker). This acts as a safety system, cutting off power in case of overloads or short circuits.

4

Energy Storage in the Battery
The power is then stored in a VRLA battery, acting as an energy bank—ready to supply electricity even during the night or on cloudy days.

5

DC to AC Conversion via Inverter
When using AC loads (like household lamps), the battery's DC power is converted to alternating current (AC) using an inverter. DC loads can also be powered directly from the battery.

6

Powering the Loads (DC and AC Lamps)
The stored energy is used to turn on various lights, both DC and AC. Students can experiment with different load configurations using real components.

7

Monitoring and Analysis
To observe system performance, the digital display and multimeter show real-time voltage and current values. This is where students learn to measure and analyze electricity hands-on.

8

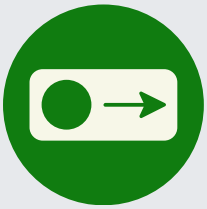
Monitoring and Analysis
Adjusting the Panel's Position
Using the manual linear actuator and switch, students can manually tilt the panel. A compass and protractor help find the ideal direction and angle toward the sun.

Why Choose UMALO?

Hands-On Learning of Renewable Energy
Students don't just learn from books, they experience the full energy flow from solar panels, through batteries, to actual loads.

Real Industrial-Grade Components
Equipped with real-world components such as MPPT controllers, MCBs, inverters, and VRLA batteries, this is more than just a basic simulation.

Modular and Practical System
All components are neatly arranged in a portable, durable, and safe system, perfect for educational environments.



Manual Tracking for Deeper Understanding
With a manual linear actuator and switch, students can adjust the panel's angle themselves, learning how sunlight direction affects energy production.

Real-Time Data Monitoring
Digital displays and multimeters show real voltage and current, allowing students to analyze performance with precision.

Designed for Active, Hands-On Practice
Perfectly tailored for elementary to high school levels, vocational programs, and hands-on training sessions.

HOW TO CONTACT US

085282651911

www.umalo.id

business@umalo.com

Depok, Jawa Barat