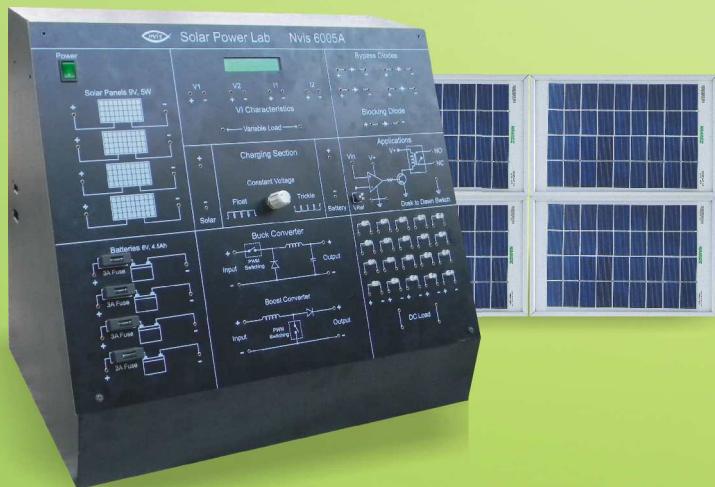




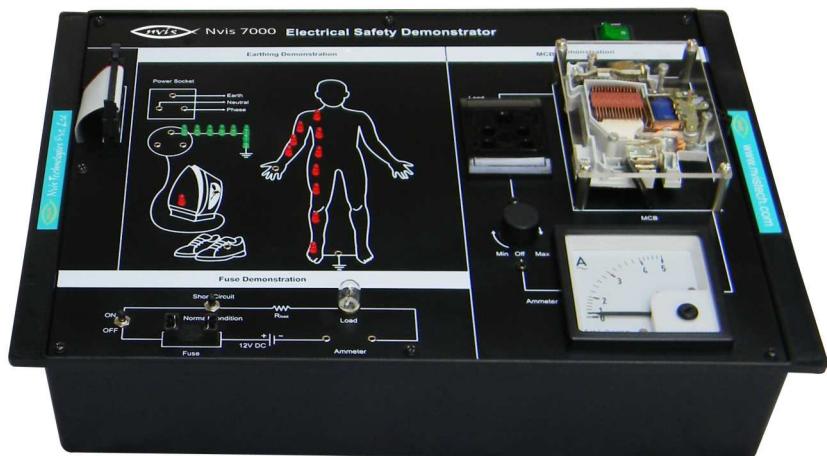
Free Clean Energy from the Sky Go Green. Go Solar.



Basic fundamentals of Solar PV Technology



Nvis Technologies Pvt. Ltd.



The “Electrical Safety Demonstrator Nvis 7000” is a useful board for students to understand the basic concepts and fundamentals of many electrical safety standards. Before working with any electrical or electronic device, it is essential to learn about these electrical safety standards. The trainer is helpful to learn, how to avoid accidents, that generally occurring while handling any electric or electronic device. The trainer has been designed for the people who are working in an electrical environment.

Features

- Designed, considering all safety standards.
- Exclusive design and attractive presentation of each block.
- This trainer represents many essential safety precautions.
- Unique demonstration & importance of Earthing.
- Real time appearance of MCB to help the students to understand its mechanical arrangement.
- Demonstration of Fuse in very easy way.
- Provided with a manual containing coloured graphical representation of many safety standards and with very interesting activities which are to be performed by students.

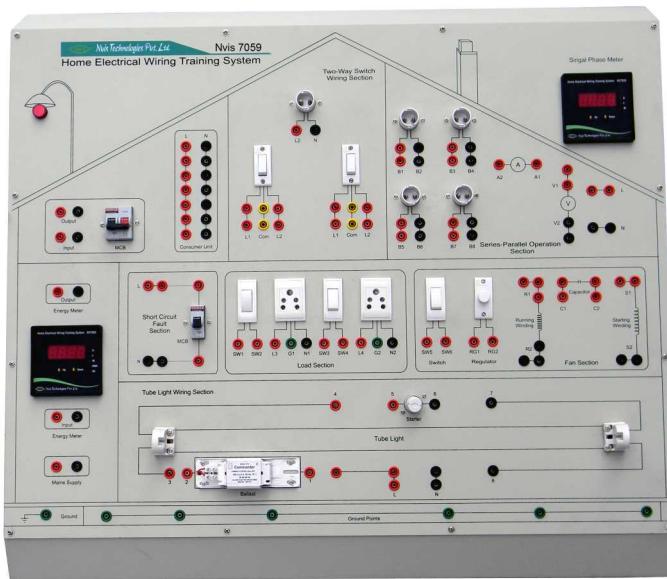
Purpose

The purpose of this board is to increase student's awareness of :

- How to use the electricity safely in home and laboratories ?
- The dangers associated with power lines and sub-stations.
- The effects of electrocution on the body.
- Strategies to avoid electrical accidents.

Scope of Learning

- Performing different electrical activities to avoid electrical hazards.
- Study of importance of Earthing in any electrical device.
- Study of role of Fuse in any electrical or electronic circuit.
- Study of importance and working of Miniature Circuit Breaker (MCB).



Home Electrical Wiring Training System is a product which is helpful for students to get familiar with home wiring circuits. This product provides a realistic training environment which is essential for every electrical engineering student and also for apprentice electrician.

It consists of Single Phase Energy Meter, MCB, Controlling Switches, Tube Light with Choke, Regulated Switch, Ceiling Fan, etc. Good quality safe terminals and sockets are provided at appropriate places on board for power supply and load connections.

Features

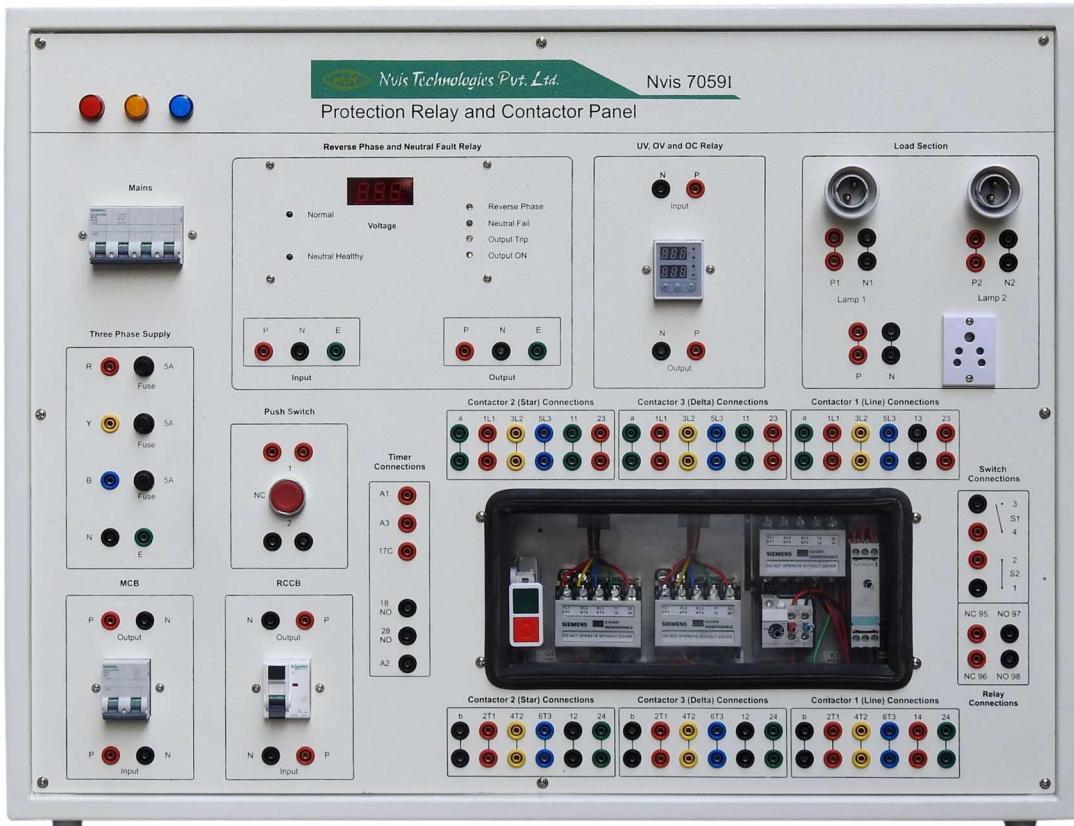
- Equipped with Multifunction meters with kWh display
- Complete practical learning for wiring in Houses
- Test points are provided to measure voltage at different points
- Provided with house hold appliances like fan
- Designed by considering all the Safety Standards
- Diagrammatic representation for the ease of connections

Scope of Learning

- To study the connection /measurement of
 - Energy Meter and Consumer Unit
 - Voltage
 - Current
 - MCB wiring
 - Tube Light wiring
 - Two-Way Switch wiring
 - Short Circuit Fault
 - Switchboard
 - Ceiling Fan
 - Series-Parallel Operation on load

Technical Specifications

Mains Supply	: 230V AC ±10%, 50Hz
Energy Meter Specifications	
Meter Constant	: 1600 impulses/kWh
Display Counter	: 100 impulses/kWh
Single Phase MCB	: 6A
Load specifications	
Tube Light	: 20W, 220-240V
Ceiling Fan	: 50W, 220-240V
Maximum Load Current	: 4A
Dimensions (mm)	: W 900 x D 450 x H 670 (panel) W 250 x D 285 x H 340 (motor)
Weight	
Panel	: 26kg (approximate)
Motor	: 5kg (approximate)



A relay is automatic device which senses an abnormal condition of electrical circuit and closes its contacts. These contacts in turns close and complete the circuit breaker trip coil hence make the circuit breaker tripped/disconnected the faulty portion of the electrical circuit from rest of the healthy circuit. Nvis 7059I Protection Relay & Contactor Panel is provided to learn the operating principle of Over Current Relay, Over Voltage Relay and Under Voltage Relay.

A contactor is an electrically-controlled switch used for switching an electrical power circuit. A contactor is typically controlled by a circuit which has a much lower power level than the switched circuit. In this product students can make the operational circuit of these contactor by using power supply and load (optional). Also it is provided with delay timer and relay.

A break in neutral conductor, within three phase or single phase system, can result into wide voltage variation between phase to phase and phase to neutral& shall cause heavy damages to the equipments connected to the system. Nvis 7059I is designed to demonstrate the neutral protection.

Feature

- Neutral failure protection.
- Over current protection.
- Over voltage protection.
- Under voltage protection.
- LED indications along with audio alarm.

Scope of learning

- To study the operating principle of over voltage relay.
- To study the operating principle of under voltage relay.
- To study the operating principle of Neutral failure protection.
- To study the operating principle of over current relay.
- To study the operating principle of contactor.
- To study the operating principle of star- delta starter & timer.

Specification

- **Under voltage, Over Voltage, Neutral failure protection relay**

Characteristics	Specifications/Rating
	1 - Phase
Function	Detection & Tripping for Undervoltage / Overvoltage / Neutral fail / Reverse phase
Supply Voltage	230VAC 1 Phase / +20%, -30% 3 wire (P N & E)
Frequency	47 Hz to 53 Hz
Trip Levels	Under Volt-170V Over Volt-270V

Over current relay : 1-63 A(adjustable)

: Default- 40A

RCCB

Current : 25 AMP

Pole : 2

Earth leakage sensitivity : 30 mA

Push Button : 3 nos.(ON, OFF, Reset)

Contactor : 3 nos.

Over load relay : 1no

Timer : 1 no.

Optional

- Single Phase Variac 5A.
- Single Phase AC/DC load (Nvis 726).
- Three Phase variac 10A.



Nvis 7090 MCB (Miniature Circuit Breaker) and HRC (High Rupturing Current Capacity) Fuse Testing System is designed to explain the operating behavior and characteristics of MCB's and HRC fuse. It includes B type MCB, C type MCB and HRC fuse. These are protective devices capable of carrying currents under normal circuit conditions and automatically break the circuit whenever over load or short circuit condition occurs.

Nvis 7090 provides complete learning contents to demonstrate the internal working of MCB's and HRC fuse. The MCB's are provided in transparent case to visualize the internal architectures. Two precise integrated circuit based Thermometers are provided on bimetal contact of MCB's to analyze the temperature rise and fall.

Digital timer is provided with start and stop facility to study the current versus tripping time characteristics. Inbuilt isolated variable AC Power Supply is provided for safety. The student will learn the difference in various classes of MCB's.

Features

- Alphanumeric 16X2 Big Font LCD for better visibility
- Isolated Power Supply using Transformer
- Inbuilt variable current injection facility
- Transparent MCB's to understand internal architecture and its working
- Inbuilt Timer, Current & Temperature on LCD
- MCBs are mounted with temperature sensor for current temperature analysis
- Equipped with supply indication lamp
- Designed by considering all the safety standards
- Diagrammatic representation for the ease of connections
- Learning material CD

Scope of Learning

- Study the operating characteristics of Miniature Circuit Breaker B-type 6A. Also draw the Current Time & Temperature-Time characteristics
- Study the operating characteristics of Miniature Circuit Breaker C-type 2A. Also draw the Current Time & Temperature-Time characteristics
- Study the operating characteristics of HRC fuse

Technical Specifications

Mains Supply : 0-220V AC \pm 10%, 50Hz

Single Phase Variac

Input : 230V

Output : 0-270V

Current : 10A

LCD Display Screen

MCB-C00.00.05.09
I.6.00A 38.3 C

Single Phase Transformer

Rating : 1kVA

Input : 230V

Output : 230V

Experimental Setup

MCB's : B type, 6A

C type, 2A

HRC Fuse : 6A

Temperature Sensor (2 Nos.)

Type : Mounting type

Name : LM35

Display Resolution : 0.1°C

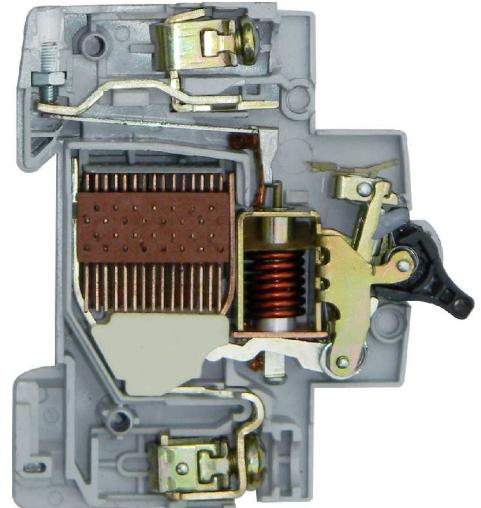
Mounting : With Brass holder mounted on MCB's

Protective Devices : 10A (SPN)

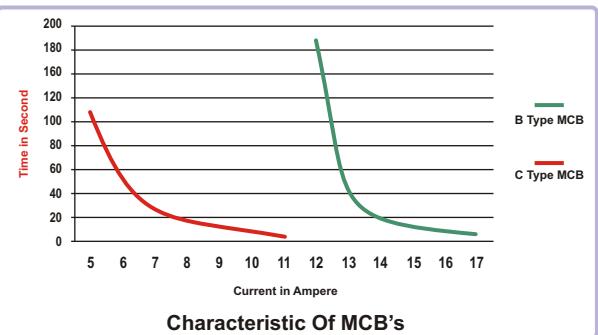
Rheostat : 100 / 5A

Dimension(mm) : W 600 x D 350 x H 450

Weight : 22kg (approximate)

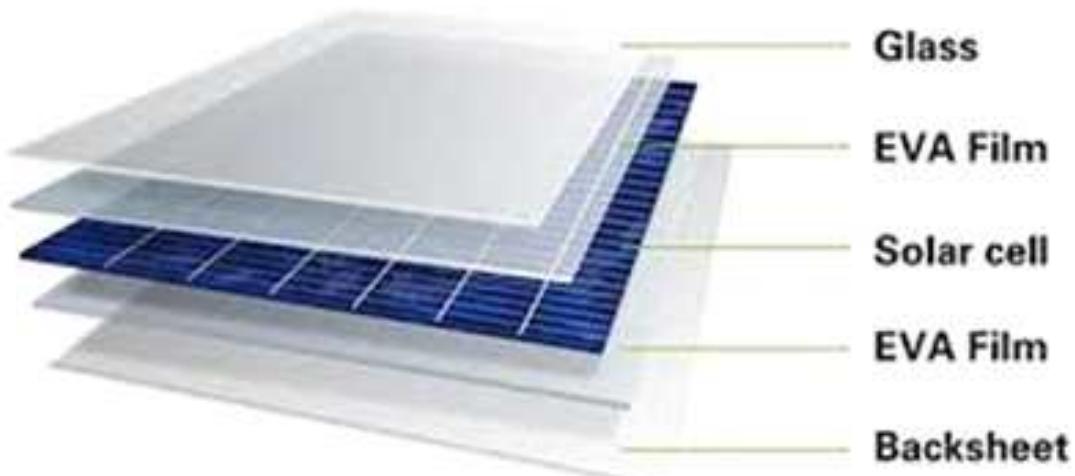


Internal MCB Structure





Cut models of photo voltaic cell assembly Nvis 6005C



** Shown image is just for illustration original may differ

Nvis 6005C Cut model of photo voltaic cell assembly is used to understand and learn about the construction of solar PV panel.

This product is provided with a working photovoltaic cell also along with the different parts of solar photovoltaic cell.

This product is used for demonstration of different parts of photovoltaic cell.

A Solar Simulator Lab provides illumination Spectrum approximately similar to Sunlight. The Solar simulator is used to provide controlled test facility inside laboratory.

To find the characteristics of a Solar cell or Solar panel, we need to expose them to Sun light. It is very difficult to measure Solar cell or Solar panel output when there is less Sun light due to clouds. A Solar Simulator allows us to test Solar system independent from current weather conditions and time of day.



Features

- Complete system to study fundamentals of Solar Simulation
- Digital display for Voltage and Current measurement
- Quartz Halogen Lamp as a Light source
- Programmable Temperature Controller
- Heater for heating test of Solar cell
- Variable Intensity available for testing

Technical Specifications

Supply Voltage : 220V AC $\pm 10\%$, 50Hz

Solar Cell

Open Circuit Voltage (Voc) : 2V DC

Short Circuit Current (Isc) : 180mA

Quartz Halogen Lamp : 220V, 50Watt (2 nos.)

Voltmeter : 0-20V

Ammeter : 0-2000mA

Intensity Control : Variable (In five steps)

Temperature Controller : up to 99°C

Heater : 25 Watt

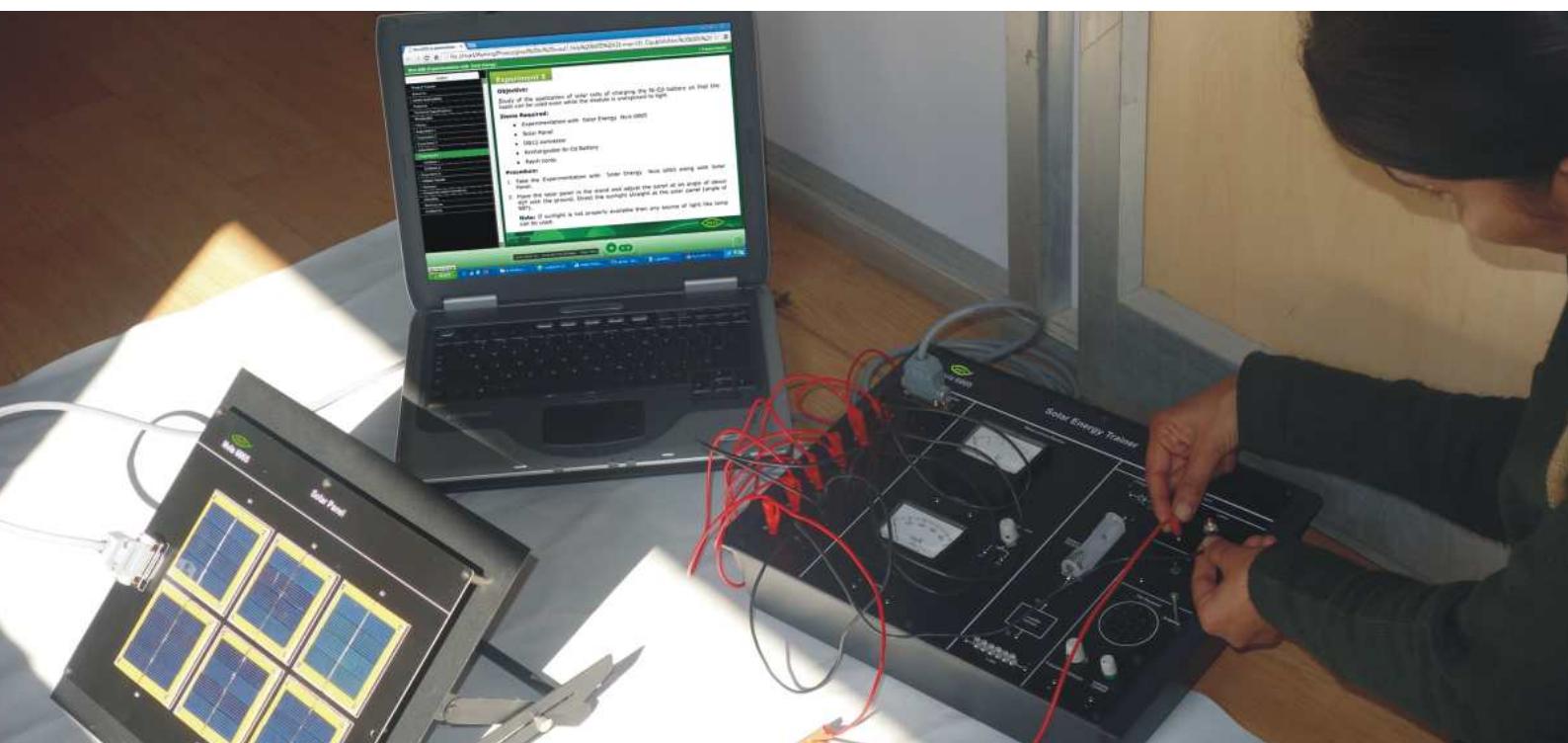
Load Resistance : 0-100 10 turn

: 0-10 1 turn

Fuse : 1Amp

Weight : 9kg (Approximate)

Dimension (mm) : L 260 x B225 x H 500



Experimentation with Solar Energy Nvis 6005 is a versatile training system to be used in laboratories. It introduces the basic concept of solar cell (photovoltaic cell) of converting sunlight directly into electrical energy. The system works as a live demonstration unit of solar cells in terms of its concepts and applications. This system is provided with Solar Energy Trainer and a Solar Panel.

Features

- Complete training system to study the fundamentals of photovoltaic system
- The system has two modes for study: Characteristics and Application Modes
- On board voltmeter and ammeter are provided to measure the voltage and current respectively, during various modes of operation
- Charging the batteries using solar energy
- Weather proof solar cells
- Portable and light weight
- Online product tutorial

Technical Specifications

Solar Panel : Consists of 6 solar cells

Maximum Voltage of each solar cell:1.5V

Maximum Current of each solar cell:150mA

Voltmeter	: 0-10V
Ammeter	: 0-500mA
Potentiometer	: 5K
2 AA Rechargeable NiCd Battery	: 1.2V
Bulb	: 1.2V, 270mA
Fan	: 1.5V, 400mA
FM Band Radio	: 12V
Dimension (mm)	: W 365 x D 265 x H 120

Scope of Learning

- Calculation of voltage and current of solar cells in series
- Calculation of voltage and current of solar cells in parallel
- Study of V-I curve and power curve of solar cells to find out maximum power point (MPP)
- Calculation of efficiency of solar cells
- Application of solar cells in domestic purposes :
 - Charging of battery in load and no load condition
 - Operating bulb, fan and radio





Nvis 6019 Understanding Solar Tracking System is a versatile training system for study and demonstration of Solar tracking.

Solar tracker is a device which tracks the motion of the Sun, thus ensuring that the maximum amount of Sunlight strikes the panels throughout the day.

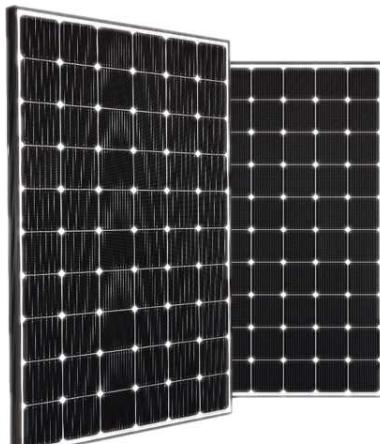


Features

- Complete training system to study the fundamentals of Solar Tracking
- Microcontroller based Tracking System
- Single-axis and Dual-axis Tracking
- Manual, Time and Auto Modes of operation in Single axis Solar Tracking
- Manual mode of operation in Dual-axis Solar Tracking
- Master Reset Switch for recovery of System
- Emergency Motor Stop Switches
- Tilt Sensors for sensing angle of panel with respect to horizontal plane
- Facility for charging battery using Solar energy as well as DC supply

Technical Specifications

Supply Voltage	: 12V DC
Solar Panel	
Maximum Output	: 18W
Power (Pm)	
Open Circuit	: 21V DC
Voltage (Voc)	
Short Circuit	: 1.07A
Current (Isc)	
Max. Output	: 17V
Voltage (Vmp)	
Max. Current (Im)	: 1.06A
DC Motor	: 12V
Rechargeable Battery	: 12V, 7Ah
Display	: 20 x 4 LCD
Light Sensor	: Phototransistor
Acceleration/Vibration	: +5V @ 1ma current
/Tilt Sensor – 3 Axis	
Fuse	: 1Amp (3 Nos.)
DC Adaptor	: 12V @ 1Amp
Dimension (mm)	: W 350 x D 280 x H 55



** Shown image is just for illustration original may differ

This set up helps to understand PWM charge controller depending on

- Time taken by battery to get fully charged
- To measure input power and output power to get efficiency of PWM charge controller
- Effect of sun tracking at different angle of inclination

Features

- Performance analysis by comparing the output of the PV module with PWM controller.
- Display units for voltage and current measurement.
- System integrated with PWM charge controller along with the batteries.
- Simple variable load demonstration by varying the rheostat.

Scope of Learning

- Find out the efficiency of PWM based charge controller at different loads conditions.
- Performance analysis of PWM type charge controllers.
- Study the effect of change in voltage and current of solar panels by series and parallel connections.

Technical Specifications

Charge controller	:	PWM type with reverse polarity protection for battery as well as load
DC voltmeters	:	1 no.
DC ammeter	:	1 no.
Battery	:	12V, 7.5Ah
Load	:	DC lamp
Solar PV module	:	Poly Crystalline Technology 40watt (optional)



** Shown image is just for illustration original may differ

It is desirable to operate the PV module at the maximum power point so that maximum power can be delivered to the load under varying temperature and insolation conditions. This is where MPPT (maximum power point tracking) charge controller comes into the play in the system.

This set up helps to understand the MPPT charge controller depending on

- Time taken by battery to get fully charged
- To measure input power and output power to get efficiency of MPPT charge controller
- Effect of sun tracking at different angle of inclination

Features

- Performance analysis by comparing the output of the PV module with MPPT charge controller.
- Display units for Voltage and current measurement.
- System integrated with MPPT charge controller along with the batteries.
- Simple variable load demonstration by varying the rheostat.

Scope of Learning

- Understanding of connection of MPPT charge controller in photovoltaic panel & load.
- Performance analysis of MPPT type charge controllers.

Technical Specifications

Solar PV module	:	Poly crystalline Technology 40 watt
Charge controller	:	MPPT – type with reverse polarity protection for battery as well as load
DC voltmeters	:	1no.
DC ammeter	:	1 no.
Battery	:	12V, 7.5Ah
Load	:	DC lamp



Street lights are a part of our everyday life. They play an important role in creating safe and more productive cities. Most people know that they only light our sidewalks and roads during the night and during the day they are shut off and unused. However, as innovation speeds up now new modern street lighting systems are being asked to do more than ever before. In addition to fulfilling their principal purpose of casting light onto dark roadways, parking areas, and public spaces, these lighting systems are increasingly evaluated for how well they reduce energy consumption, how using smart sensors they can be detect real-time changes in information such as lamp inclination, weather conditions, air pollution, availability of natural light and more.

Scientech 6205SSL Smart Solar Street Light Training Platform is designed for studying and understanding smart street lights. Scientech 6205SSL consists of temperature, humidity, LDR, PIR motion, air quality sensors. These sensors are connected with smart node which is mounted on smart pole and transfer data through zigbee to the main board for display and analysis. One can also explore charge controller and solar PV analyzer.

Features

- A friendly platform for experimenters to learn, explore and develop IoT based smart solar street light.
- Solar panel, LED light, solar charge controller, lead-acid battery.
- Battery level Indicator , DC voltmeter and ammeter.
- Smart pole with PIR, air quality (PM1, PM2.5 and PM10), temperature, humidity and ambient light sensors.
- On board charging and protection circuit for battery.
- Interactive SMART dashboard software for display information.
- Solar PV analyzer modules.
- Arduino software compatible hardware.
- Battery operated smart sensor gateway for sensor connectivity.
- USB and Zigbee connectivity for personal computer (PC) interface.
- Python, Arduino programming, embedded C and app development.
- Wi-Fi connectivity for cloud interface.
- Sensor gateway with color LCD display.
- Night vision camera for surveillance.
- Software to view sensor's real time graph analysis on PC and mobile.
- 10 din sockets for sensors and actuators interface.
- Signal test points and switch faults.
- Inbuilt voltmeter and ammeter.
- User friendly explanatory system.
- High grade FRP material enclosure.
- M.S. powder coated pole.

Sensors



Temperature &
Humidity



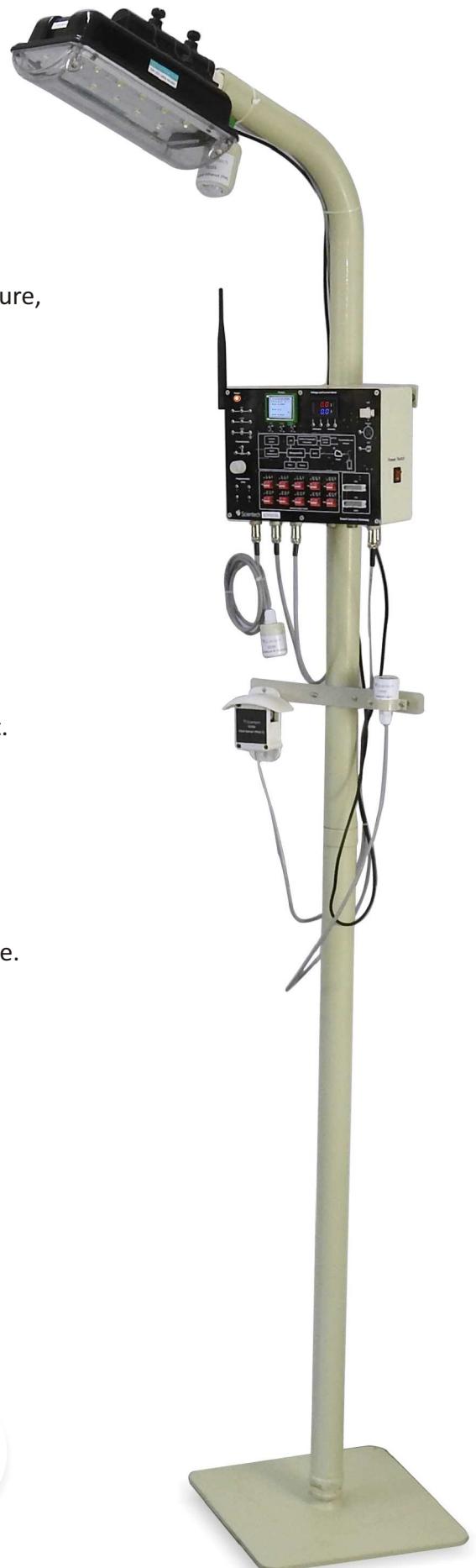
LDR



PIR motion



Air quality



Scope of Learning

Study of:

- Various parameter of smart pole.
- Interconnection of various element of smart solar led street light.
- V-I characteristic of solar panel.
- Fill factor measurement of solar panel.
- Input and output voltages of solar charge controller.
- Sensor and actuator interfacing.
- Troubleshooting method of various section of smart street light.
- IoT applications.
- C programming and python.
- Arduino IDE software.

Interfacing of:

- LED blink program.
- ACD and UART programs.
- Color LCD.
- Wi-Fi and Zigbee module.

Testing and understanding of:

- Air temperature & humidity sensor.
- Air quality PM1, PM2.5 and PM10 sensor.
- PIR and LDR sensor.

Design and develop:

- Smart street light application programs.
- Program to control on street light remotely.
- Application to make energy efficient street light.
- Application to make smart environmental monitoring system using street light.
- Program to configure events and alarms.
- Interfacing of Wi-Fi and Zigbee modules.
- Implementation of python program to collect data and upload on cloud.

Technical Specifications

Main board:

Processor	: 64bit cortex A53 ARMv8 Quad core processor 1.4GHz
Connectivity	: 802.11 b/g/n Wireless LAN bluetooth 4.1, zigbee, USB & Ethernet
RAM	: 1GB LPDD2
Memory	: 32GB
OS	: Linux
Ethernet	: 10/100 base T Ethernet socket
Video output	: HDMI and composite RCA
USB port	: 4 nos.

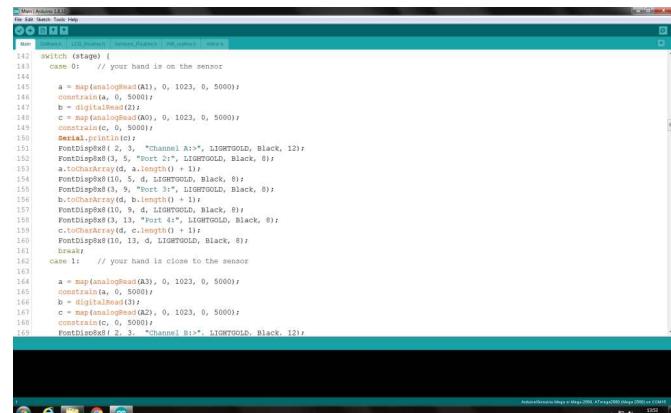
Smart pole and node

Microcontroller	: ATMega2560
Sensors and actuator connector	: 10 nos.
Digital input/output pins	: 34 nos.
Analog input pins	: 16 nos.
UART	: 2 nos.
I2C	: 1 no.
Switch faults	: 30 nos.
Test points	: 30 nos.
Power Supplies	: 5V and 3.3V
Variable potentiometer	: 1 no (10K)
Switches	: 3 nos.
Digital voltmeter and ammeter	: 0 - 25V/10A
Buzzer and LED	: 1 no. each

Color LCD	: 1.77 inch
USB	: 2.0
Wi-Fi module	: 1no. (2.4GHz)
Zigbee transceiver	: 2nos. (2.4GHz/63mW)
Flash memory	: 256 kb of which 8 KB used by boot loader
SRAM	: 8 KB
EEROM	: 4 KB
Clock speed	: 16 MHz
PIR sensor	: TTL
Temperature sensor	: 0 - 100°C
Humidity sensor	: 0 – 100 %RH
Air quality sensor	: PM, PM2.5, PM10
Ambient light sensor	: Analog output
Solar panel	: 40W
Battery	: 12V, 26 Ah
Charge controller	: 16-26V, 0.7A
LED light	: 10W
Rheostat	: 100 Ohm, 3A
MCB	: 16A
DC ammeter	: 5A
DC voltmeter	: 100V
Battery level indicator display	: 8-70V
Power Supply	: 110V - 260V AC, 50/60Hz
Operating conditions	: 0-40°C, 85% RH

Package contains	Quantity (nos.)
• Scientech 6205SSL training platform	1
• Rheostat - 100 Ohm, 3A	1
• Solar panel (40W)	1
• MS powder coated pole with stand	1
• LED light (10W)	1
• Smart sensor gateway	1
• 4mm BS-10 banana patch cord	25
• Wireless keyboard & mouse	1
• PIR sensor	1
• Air quality sensor	1
• Temperature and humidity sensor	1
• Ambient light sensor	1
• Night vision camera	1

Software window



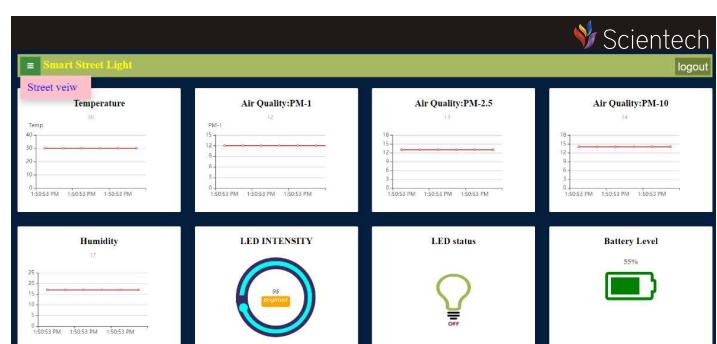
```

142 switch (stage) {
143     case 0: // your hand is on the sensor
144         a = map(analogRead(A1), 0, 1023, 0, 5000);
145         constrain(a, 0, 5000);
146         b = digitalRead(2);
147         c = map(analogRead(A0), 0, 1023, 0, 5000);
148         constrain(c, 0, 5000);
149         Serial.println("a");
150         Serial.print("b: ");
151         Serial.print("c: ");
152         Serial.print("d: ");
153         FontTitle8x8(3, 5, "Channel A1", LIGHTBOLD, Black, 8);
154         FontTitle8x8(3, 5, "Port 2", LIGHTBOLD, Black, 8);
155         a1.drawString(d, a.length() + 1);
156         FontTitle8x8(10, 5, d, LIGHTBOLD, Black, 8);
157         FontTitle8x8(10, 5, "Port 4", LIGHTBOLD, Black, 8);
158         FontTitle8x8(10, 5, "Channel A0", LIGHTBOLD, Black, 8);
159         b1.drawString(d, c.length() + 1);
160         FontTitle8x8(10, 5, c, LIGHTBOLD, Black, 8);
161         FontTitle8x8(10, 5, "Channel B1", LIGHTBOLD, Black, 8);
162         break;
163     case 1: // your hand is close to the sensor
164         a = map(analogRead(A3), 0, 1023, 0, 5000);
165         constrain(a, 0, 5000);
166         b = digitalRead(3);
167         c = map(analogRead(A2), 0, 1023, 0, 5000);
168         constrain(c, 0, 5000);
169         FontTitle8x8(2, 3, "Channel B1", LIGHTBOLD, Black, 12);

```

Sensor interfacing code

Dashboard



Software windows



Features

- Microcontroller based Constant Current Power Supply with LCD
- Transparent Tank for better visibility of process
- Discharge outlet for easy removal of sludge
- Aluminum and Stainless Steel Electrodes for comparative study
- Setup can be run without mains supply (optional Solar Panel)
- Online product tutorial



Waste Water and Treated Water

Electrocoagulation is the process of Destabilizing Suspended, Emulsified or Dissolved contaminants in an aqueous medium by introducing an electrical current into the medium. The electrical current provides the electromotive force to drive the chemical reactions. When reactions are driven or forced, the elements or compounds will approach the most stable state.

Technical Specifications

Electrocoagulation Tank

Volume	: 1L
Material	: Acrylic

Settlement Tank

Volume	: 500ml
Material	: Acrylic
Filters	: Sand and Charcoal

Electrodes

Material	: Aluminum and Stainless Steel
Rod Dimensions (mm):	8 x 310

Solar Power Supply

Power	: 75 Watt
-------	-----------

Meters

PH meter
TDS meter



Energy storage is becoming increasingly important for improving the efficiency, reliability and price-competitiveness of power utilities and Electric Vehicles, and to achieve deeper integration with intermittent renewable energies.

Battery is an energy storage device consisting of two or more electrochemical cells that convert stored chemical energy into electrical energy and used as a source of power. As an energy storage device, the use of the battery is increasing day by day such as in automobiles, inverter, UPS, off-grid renewable energy sources.

Nvis 425 and Nvis 425A Battery Characteristics Training Systems introduce students to the operation of Lead-Acid and Li-ion batteries. Hands-on experiments cover the charging and discharging characteristics of lead-acid and Li-ion batteries.

Features

- Models for study of battery characteristics of Lead-Acid and Li-ion batteries.
- Real time and interactive training setup.
- DC Power source and charge controller.
- Meters and battery level indicator for analysis.
- Designed with all safety standards.
- PC Interface for real time curve plotting using built-in DAQ.

Scope of Learning

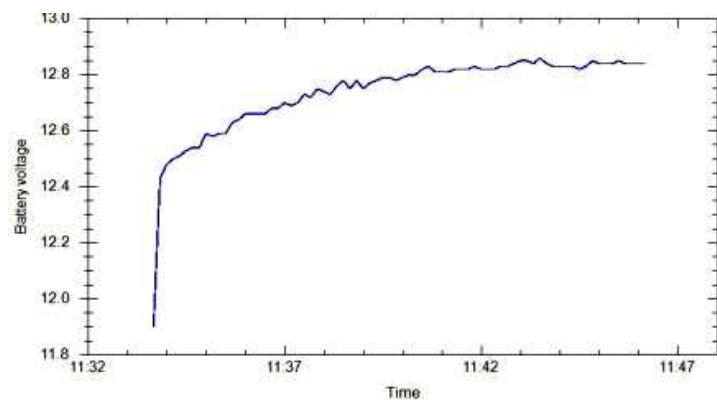
- To understand the overall functioning of lead-acid and Li-ion batteries.
- To study the charging and discharging characteristics of lead-acid and Li-ion batteries.

Technical Specifications

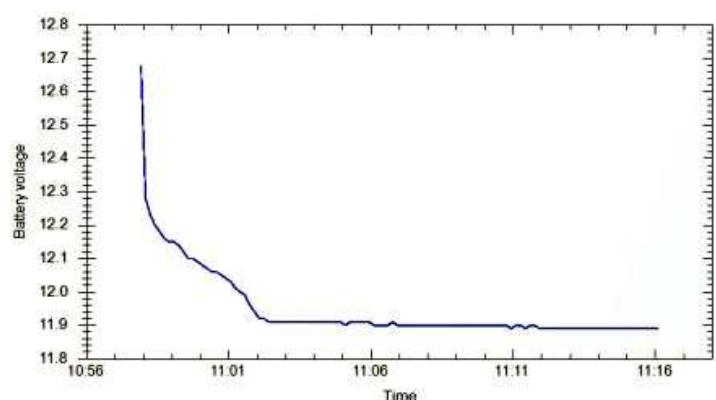
Parameters	Lead-Acid battery	Li-ion battery
Model	Nvis 425	Nvis 425A
Voltage	12V	12V
Capacity	7Ah	7.8Ah
DC voltmeter	20V	20V
DC ammeter	10Amp	10Amp
Charge controller	PWM based	PWM based
Battery level indicator	LCD display	LCD display

Laptop (optional)

Charging characteristics



Discharging characteristics





Wind Power is the energy obtained from the wind. It is one of the oldest exploited energy sources by humans and today is the second most seasoned and efficient energy of all renewable energies. Wind power is the most efficient technology to produce energy in a safe and environmentally sustainable manner: it is zero emissions, non pollutant, inexhaustible and Contributes to sustainable development. Wind energy does not emit toxic substances or contaminants into the air, which can be very damaging to the environment and to human beings.

Wind power consists of converting the energy produced by the movement of wind turbine blades driven by the wind into electrical energy. Considering this, we have designed product which justify the significance of wind energy by study its operational working and how it converts electrical energy from the wind. We have tried to make the product as easiest as possible so that expertise can easily grasp the fundamentals of wind turbine. It includes inbuilt Inverter which can be operated in both mains and through batteries.

Features

- A unique system for Electrical Generation through Wind Energy and its learning.
- Equipped with Wind Charge Controller with overload and low battery protection
- Diagrammatic representation of different blocks of board.
- Designed by considering all the safety measures
- Special design patch cords for additional safety
- Highly accurate microcontroller based measuring instruments.
- Equipped with multifunction meter to analyse output capacity
- System is flexible to operate in mains as well as UPS mode
- Provided with 100AH Battery

Scope of Learning

- To study wind power generation system

Technical Specifications

Wind Turbine

Power rating	:300Watt
Generator output	:24V
Blades	:3nos.
Rotor	:Three FRP blades along with standard steel nut-bolts & GI coated turbine

Structure :5ft, MS structure with floor stand

Wind charge controller

Voltage	:24V
Protection	:Overload and low-battery protection

Storage battery (2nos)

Capacity	:100AH
Type	:C10

Inverter

Capacity	:750VA
Input voltage	:190~260V
AC output voltage	:Same as input (mains mode)
Output voltage	:210~245V (Inverter Inverter)
Output frequency	:50Hz ±0.1Hz (Inverter mode)
Output waveform	:Modified Sine wave (Inverter mode)
Efficiency at full load	:>80%
Technology	:Microcontroller based design

Digital meters

AC voltmeter	:500V
AC ammeter	:10A
DC voltmeter	:300V
DC ammeter	:40A

AC multifunction meter

Measurements	:AC voltage, AC current, frequency, power, kWh
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Package contains :Quantity (nos.)

Storage battery	:1
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Optional accessories

Nvis 726

Blower

Solar PV Test & Measurement tools and equipments



Nvis Technologies Pvt. Ltd.



Nvis 726 AC/DC Load is an important device in all the Electrical laboratories. One can connect a load upto 1.2KW using this product. The device comes with On Board Switches, so that one can vary the load as required, in steps of 100W. The product is designed so as to provide load for various experiments of Transformer, Motors, Generators etc.

Features

- Exclusive and rugged designed panel
- Stand alone operation
- Designed by considering all the safety precautions
- Online Product Tutorial

Technical Specifications

Mains Supply	: AC / DC, 230 V ±10%
Load Range	: 0 - 1.2 kW, in steps of 100 W
Load Type	: Resistive (Lamp Load)
Ammeter (MI)	: 10 A
Dimensions (mm.)	: W 600 ' D 350 ' H 450



DC Load

Nvis 726D



Nvis 726D DC Load is an important device in all the Electrical laboratories. The device comes with On Board Switches, so that one can vary the load as required. The product is designed so as to provide load for various experiments.

Features

- Exclusive and rugged designed panel
- Stand alone operation
- Designed by considering all the safety precautions
- Online Product Tutorial

Technical Specifications

Mains Supply	:DC, 24 DCV
Load Range	:upto 140 Watt
Load Type	:Resistive (Lamp Load)



Rooftop Mounting Structure

Nvis 436RMS



** Shown image is just for illustration original may differ

Nvis 436RMS Rooftop mounting structure for solar PV module is a product for mounting Solar panels on rooftop.

This is designed in such a way that user can tilt it as per the geographical coordinates of site.

Technical Specification

Structure	:	MS, powder coated
Height	:	3 feet
Suitable PV wattage	:	250 watt (approx dimension of PV panel is 1640 x 990 x 40 mm)
Solar panel	:	250 watt (optional)

Features

- 3½ Digital Multimeter
- 4000 Counts Large LCD Display with Auto/Manual Range
- No Power-OFF under natural operation
- Data Hold, Max. / Min. Value Hold
- Capacitance, Frequency / Duty Cycle, Temperature and Transistor Test



Technical Specifications

Basic Functions	Range	Basic Accuracy
DC Voltage	0.1mV ~ 1000V	±(0.5% + 4digit)
AC Voltage	0.1 mV ~ 750V	±(0.8%+ 6digit)
DC Current	0.1uA ~ 20A	±(1.0% + 5digit)
AC Current	0.1uA ~ 20A	±(1.5% + 5digit)
Resistance	0.1Ω ~ 40MΩ	±(0.8% + 2digit)
Capacitance	10pF ~ 200uF	±(3.5% + 8digit)
Frequency	0.1Hz ~ 30MHz	±(0.5% + 4digit)
Celsius	-40°C - 1000°C	±(0.8% + 4digit)
hFE (NPN or PNP)	0 ~ 1000	

Special Function

Diode test	✓	Function Protection	✓
Transistor testing	✓	Input impedance	10MΩ
Continuity Buzzer	Lower 30Ω ±10Ω	Sampling Rate	3 times per second
Low Battery Display	Lower 2.4V	AC Frequency Response	40-400Hz
Auto Power OFF	Approx. 30 min.	Power	F3V AAA

Dimension : 185 (H) X 93(W) X 35(D)mm

Included Accessories : Test Leads, Holster, Manual, TP01 Temperature Probe Bead type



Hydrometer



** Shown image is just for illustration original may differ

A hydrometer is an instrument used for measuring the relative density of liquids based on the concept of buoyancy.

A hydrometer usually consists of a sealed hollow glass tube with a wider bottom portion for buoyancy, a ballast such as lead or mercury for stability, and a narrow stem with graduations for measuring.



Lux meter



** Shown image is just for illustration original may differ

Lux is a measurement of the overall intensity of light within an environment for any given area or distance from the source. It is the amount of light in an environment perceived by the human eye. In other words, the lux is a unit of measurement of brightness, or more accurately, luminance

Technical Specifications

Measure range	:	0-200000Lux
Unit	:	Lux
Receiving light	:	Silicon of photo electricity diode
Power source	:	9V battery



Soldering / Desoldering Stations Digital Soldering Station

80 Series - Nvis 81



Features

- ▶ Accurate and advanced temperature Control with micro controller technology
- ▶ User-friendly operation
- ▶ Set / Read of temperature
- ▶ Increase and Decrease of keys to set temperature once set the read temperature will display after two seconds by default
- ▶ Temperature control accuracy $\pm 1^\circ\text{C}$
- ▶ Last set value of temperature is stored in memory
- ▶ Digital calibration will be done through micro controller to avoid analog components tolerances
- ▶ Password protection feature to stop tampering with set temperature by the operators for (Bulk Customers)
- ▶ Burn proof silicon cable with thermal resistance up to 600°C

Technical Specifications

Power consumption	:	60 W
Input voltage	:	170 to 270 V (190 to 270V)
Temperature range	:	180 to 480 °C
Temp stability	:	$\pm 10^\circ\text{C}$
Temp accuracy	:	$\pm 1^\circ\text{C}$ of tolerance at idling time
Tip to ground potential	:	Under 2 mv
Tip to ground resistance	:	Under 2 Ohms

Included Accessories

Unit	:	01
Complete Soldering Handle	:	01
Stand	:	01
Sponge	:	01



Sunshine recorder



** Shown image is just for illustration original may differ

Sunshine recorder is a self recording instrument for continuance of sunshine. The effect of heat of sun is used as recording medium.

Instrument consist base plate, stand support for the sphere with attached metal bowl and glass sphere. And card is provided with a time division. The inner side of the bowl and thus the applied card are situated concentrically to the glass sphere and in its focal distance. The way of focus will be recorded as a line corresponding to apparent course of the sun.

Tape screw has been provided for support to sphere. And shape and size of spherical zone have been chosen in such way that the glass sphere may unchecked be exposed to sunrays.



Nvis Automatic & Intelligent Weather Monitoring System incorporates one of the latest IoT applications in real-time weather monitoring. It provides users to have real-time access of weather data from different locations in areas covered by mobile network.

Weather information like temperature, humidity, wind speed and direction, rain fall, UV index and solar radiation is gathered simultaneously from Nvis Weather monitoring system. All the data can be centralized, organized and sent to the observatory through GPRS network. **Nvis 6010** provides extensive compatibility of Sensors with built-in GPRS mobile network connectivity. Through cloud management software, the data from weather stations is displayed in the form of dashboard & charts. Since the data transmission is instantaneous, alert is triggered in cloud management software once abnormal weather data is received. The observatory can issue warning signal to the public immediately after poor weather condition is recognized.

Overall **Nvis 6010** is a very versatile system, allowing users to examine data that is essential to their operations.

Applications:

- Agriculture
- Conservation Engineering
- Environmental Education
- Weather Services
- Fire Station
- Alternative Energy
- Meteorology
- Solar Power Project
- Wastewater Treatment
- Construction
- Data Centers
- Water Management
- Disaster Mitigation

Features



High Accuracy
& Reliability



Communication over
GPRS



Battery Charging from
Solar Panel



Real time Data Access
on Web



Low
Maintenance



Data Storage
Memory

Technical Specifications

Sensors Specifications :

Air Temperature

Operating Range : 0°C to 100°C
Resolution : 1°C

Relative Humidity

Operating Range : 5% to 95%RH
Resolution : 1%

Solar Radiation sensor

Output : 0-2VDC
Range : 0 to 2000W/m²
Spectral Response : 400 to 1100 nm

Atmospheric Pressure Sensor

Detection Range : 15- 115kPa
Response time : 5 Sec.

Air Quality Sensor (PM2.5)

Detection Range : 10 - 500 ppm
Response time : 5 Sec.

Wind Speed Sensor

Speed : 0 to 20m/S
Resolution : 1m/S

Wind Direction Sensor

: North, East, West, South,
North-East, East-South,
North-West, South-West

Rainfall

: Tipping bucket in mm

UV Index Sensor

Response wavelength : 200nm-370nm
Response time : 5 seconds

Power Supply

Battery : 12V/40AH
Solar Panel : 75W

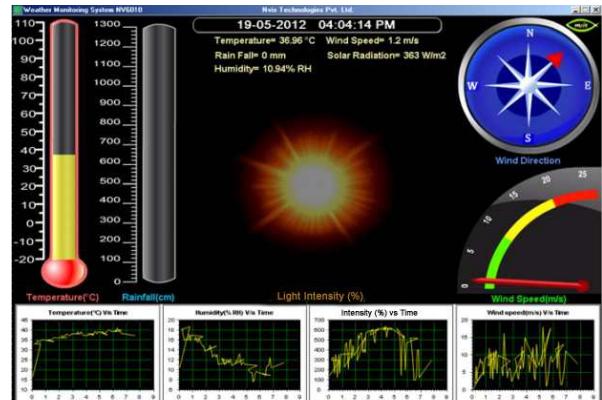
Wireless Transmission

: GPRS Based

Cloud Services

: 1 Year

Software window



Application software for Dashboard for remote monitoring and analysis.

Note: SIM card should be owned by customer.
Customer has to renew cloud services after 1 year.



Nvis 590 Pyranometer is a device that measures solar irradiance from a hemispherical field of view incident on a flat surface. The SI units of irradiance is watt per square meter (W/m^2). Traditionally pyranometers were mainly used for climatological research and weather monitoring purposes. However recent worldwide interest in solar energy has also lead to an increased interest in pyranometers.

To measure irradiance, it is required by definition that the response to “beam” radiation varies with the cosine of the angle of incidence. This ensures a full response when the solar radiation hits the sensor perpendicularly (normal to the surface).

Features

- Handheld device.
- Microcontroller based measurement.
- Low power consumption.
- Water and dust proof sensor casing.
- Light weight design.
- Protective dome given for safety of sensor.

Technical Specifications

- Detection range 0 to $2000\text{W}/\text{m}^2$
- Operating voltage: +5V
- 16x2 LCD display
- Sensor connector -DIN type
- Cable length:1meter



Features

- Microcontroller based measurement
- Low power consumption and 5V operating voltage
- Water and dust proof sensor casing
- Light weight design with dedicated connector for easy to carry
- 1meter long cable with handheld display device

Technical Specifications

- Detection Range 0 to 1000w/m²
- Operating voltage: 5V
- 16x2 LCD output
- Sensor connector -DIN type

Introduction

Use of Solar cell for global solar irradiation measurements

Pyranometers are expensive and not easily available. Therefore in order to measure the global solar irradiation a solar cell can be used.

It is known fact that the current output of solar cells is a linear function of solar irradiation. Also, the current output of solar cell does not depend strongly on the temperature of the solar cell. Therefore solar cell current can be used as a measure of solar irradiation at a given time.

$$\text{Cell current} \propto \text{Solar Irradiation}$$

or

$$\text{Solar Irradiation (W/m}^2\text{)} = K * \text{Cell current (Amp)}$$

Here K is the proportionality constant.

Normally solar cells in short circuit mode are used for measurement of solar irradiation. A calibrated solar cell (Figure 5) is provided with the laboratory kit of '1000 teachers training program'. This solar cell is calibrated against the Pyranometer.



Calibrated
solar cell



Solar PV Module Analyzer

Nvis 6005S



Solar PV module analyzer is used to study the performance of Solar PV modules and to draw its VI characteristics

Features

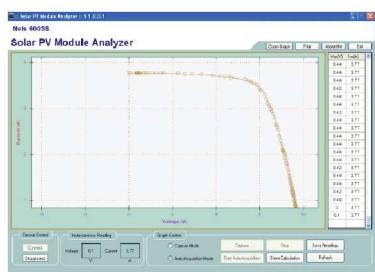
- Instrument to determine characteristics of Solar PV modules
- Microcontroller based design
- RS232 connectivity
- 16 x 2 LCD
- Mains and Battery operation
- User interactive software

Applications

- Quality Control in the Production of PV Modules
- Identification of Solar Power System requirements
- Maintenance of Solar Panels
- For verifying best installation angle of Solar Panels
- Useful at installation sites

Technical Specifications

Power Supply	: +5V DC
DC Voltage Range	: 0-50V
DC Current Range	: 10A
Measurement	
Max. Voltage(V)	: at P_{max}
Max. Current(I)	: at P_{max}
Voltage at Open Circuit	: V_{oc}
Current at Short Circuit	: I_{sc}
Instant Power	: W
Battery	: 9V
Dimension (mm)	: L 170 x B 93 x H 35
Weight	: 500gms (approximate)



V-I curve of Solar PV module



Hlogen lamp with Tripod Nvis 6019H



*Solar Panel optional



** Shown image is just for illustration original may differ

Nvis 6019H, Halogen Lamp with Tripod is useful in experimentation in Solar Lab. In this product a 1000Watt Halogen Lamp is mounted on Tripod so that user can tilt it and adjust height also according to the need of experiment. This is provided with variable AC supply facility by using potentiometer. So that intensity of light can be varied.

Technical Specification

Voltage rating	:	0- 230 Volt AC Variable
Power adjustment	:	0- 1000Watt
Height	:	6 feet maximum



Solar Panel



** Shown image is just for illustration original may differ

Solar panel

Pm	:	350Wp
Voc	:	44.51V (approximately)
Isc	:	10.40A (approximately)
Vmp	:	38V (approximately)
Imp	:	9.4A (approximately)
Qty	:	4 Nos.



Dusk to dawn Solar charge controller Nvis 455DD



** Shown image is just for illustration original may differ

Nvis 4555A is Solar Charge controller used to recharge batteries in a controlled manner and to monitor its discharge cycle.

Dusk to dawn operation for power management is very important specially in solar street lights. It switch on the load in absence of ambient light and keep off the load in day time. It is provided with charge controller circuit to maintain the health of battery by the provisions of protections like over charge, deep discharge, etc.

It operates in day time and charge the battery and automatically switch on the DC load in night time.

Technical Specification

Operating voltage : 12VDC

Battery : Upto 100Ah

Output voltage : 16-26VDC

Output current : 700mA



Solar Charge Controller

Nvis 455MN



** Shown image is just for illustration original may differ

Nvis 455MN is a **Solar Charge Controller** used to recharge batteries in a controlled manner and also monitor its discharge cycle.

It is provided with charge controller circuit to maintain the health of battery by the provisions of protections like over charge, deep discharge, etc.

Technical Specification

Operating voltage	:	12V
Current rating	:	10A
Self consumption	:	0.7mA
Enclosure	:	ABS/plastic material



Array Junction Boxes

Nvis 436AJB



** Shown image is just for illustration original may differ

Nvis 436AJB Array Junction Boxes also referred to as PV combiner boxes, it collects DC power from PV strings with blocking diodes on each string for protecting panels from reverse current flow. Array junction boxes are dust, vermin and waterproof and made of Thermoplastic (ABS).

It is meant for combining all the incoming lines from the solar panel strings/arrays and deriving one common string/array output for the multiple array inputs.

Technical Specification

DC MCB	:	40A
Fuse	:	15A
Suitable for	:	250 watt x4 No. PV Panel
Enclosure	:	ABS Material



Clinometer (for angle measurement)



** Shown image is just for illustration original may differ

Clinometer is a device used to measure the angle of inclination. Popularly it is used for solar panel tilt angle measurement.

Features

- Easy and convenient to use
- Measures angles accurately and quickly from 0-90 degrees in any quadrant
- Accuracy within 1/2 of 1 degree

Solar off Grid Power Plant



Nvis Technologies Pvt. Ltd.



Nvis 436 Solar Power Generation and Training System has been designed considering the Solar technology applications in harnessing electricity from Sun. This system will enable students to learn the basic as well as advanced concepts of Solar Photovoltaic energy generation.

Features

- A unique system for electricity generation and learning
- A complete solution for learning solar photovoltaic system
- Provided with meters for analysis of parameters
- Provided with all safety protections
- Connector sheathed shock proof type.
- DC voltmeter and DC ammeter
- Multi function meter

Scope of Learning

- Measurement and analysis of different parameters of solar PV module
 - a. Open circuit voltage (Voc) and short circuit current (Isc) of solar PV module
 - b. Parameters measurement with parallel solar PV modules
 - c. Parameters measurement with series solar PV modules
 - d. I-V characteristics of PV module and PV array
 - e. Power curve of PV module and PV array
 - f. Efficiency
 - g. Fill Factor
- Understanding & estimating solar PV system
- Load Estimation and calculation
- Understanding units kVA and kWatt for inverter and solar PV modules
- Study of charge controller
- Study of different parameters of Inverter
 - a. Efficiency measurement
 - b. PWM switching technique
 - c. Charging of batteries
 - d. Protection like over load and low battery
- Analysis and calculate the system efficiency and losses at different stages
- Analysis of electricity generation from solar PV system
- Analysis of battery backup at different load
- Study the batteries and their specification
- Testing of battery using gravity hydrometer
- Analysis the effect of dust on solar PV module
- Analysis of effect of temperature on solar PV module
- Study about safety and precaution for installation of solar system

Technical Specifications

System includes

250Wp solar panel	:	4 nos.
Battery 100Ah	:	4 nos.

Control panel for experiments equipped with meters, connecting terminals and switches

Solar panel

Pm	:	250Wp
Voc	:	44V (approximately)
Isc	:	7.2A (approximately)
Vmp	:	38V (approximately)
Imp	:	6.5A (approximately)
Qty	:	4Nos.

Control panel with inverter

Capacity	:	1000VA
Input voltage	:	190 - 260V AC
Output voltage on mains mode	:	same as input
Output voltage on UPS mode	:	210 - 245V
Output frequency on UPS mode	:	50Hz ±0.1Hz
Output waveform on mains mode	:	same as input
Output waveform on UPS mode	:	Modified Sine wave
Efficiency at full load	:	>80%
UPS overload/UPS Short circuit	:	Yes
Technology	:	Microcontroller based
MCB	:	C type 16A-2nos

Battery

Solar battery	:	
Capacity	:	12V/100Ah
Type	:	C10
Qty	:	4 Nos.

Charge controller

Solar PV module	:	35–70V
Current	:	40A
Battery voltage	:	24V
Technology	:	PWM based MPPT
Charging stage	:	Bulk, absorptions and Float

Meters

DC voltmeter	:	0-300V
DC ammeter	:	0-40A
Multi function meter	:	Voltage-10-230V Current-100mA-5A Watt-10-1200W Energy meter display resolution- 0.001kWh Frequency-50Hz

Optional accessories

Nvis726 AC/DC load	:	
Rheostat	:	50Ω 15A x 1 nos.



Nvis 437 Solar Power Generation System has been designed considering the solar technology applications in harnessing electricity from Sun. It's a eco friendly way to generate the energy from the Sun. This system will enable students to learn the basic as well as advanced concepts of Solar Photovoltaic energy generation. Being aligned with national solar mission of India we have designed this product to provide opportunity for learner to train themself. For this mission approximately 3 lac skilled professional will be required by year 2022.

Features

- A unique Solar system for electricity generation.
- Provided with meters for analysis of parameters
- Provided with all safety protections
- Connector Sheathed Shock proof type
- DC Voltmeter & DC Ammeter
- Multi Function Meter

Scope of Learning

The Geography behind Solar PV installation

- Site assessment and planning before Solar PV installation
- Understanding the Sun position and tilting of Solar PV module
- Analysis of voltage and current at different tilt angles
- Effect of shadow on Solar PV system

Measurement and Analysis of Different parameters of Solar PV Module

- Open circuit voltage (Voc) of Solar PV module
- Short circuit current (Isc) of Solar PV module
- Parameters measurement with parallel Solar PV modules
- Parameters measurement with series Solar PV modules
- I-V characteristics of PV Module
- P-V characteristics of PV Module
- Vmp, Imp, MPP & Fill Factor Measurement of Solar PV module

Estimating Solar PV system

- Load Estimation and calculation

Charge controller

- Basics of MPPT
- Efficiency calculation of Charge Controller

Inverter & Batteries

- Testing of Inverter
- Testing of battery using gravity hydrometer

Analysis of the effect of dust on Solar PV module

Analysis of the effect of temperature on Solar PV module

Safety and Precaution for installation of Solar PV System

Charge Controller

Solar PV Module Voltage:	35–70V
Current	: 20A
Battery voltage	: 24V
Charging method	: 4 stage battery charging - Deep discharge/Boost/Absorption/Trickle mode
Temp. compensation	: Yes (Built-in ambient temperature sensor & battery temp. sensor accessory)
Product Efficiency (%)	: Up to 98.8%
Charge Controller type	: Maximum Power Point Tracking (MPPT) charging technology
MPPT Technology	: Dual channel interleaved buck-converter
Battery	
Make	: Exide Solar Tubular
Capacity	: 100Ah
Type	: C10
Quantity	: 2 Nos.
Meters	
DC Voltmeter	: 0-300V, 2 Nos.
DC Ammeter	: 0-20A, 3 Nos.
AC Multi Function Meter	: Voltage-10-230V : Current-100mA-5A : Watt-10-1200W : Frequency-50Hz

Structure for Solar Panel

Material	: MS
Tracking Type	: Manual, Dual Axis Seasonal and day wise
Assembly	: Detachable and easy to install
Quantity	: 2 sets.
Safety and Protection	
MCB (DC)	: 16Amp. for solar panels and 25 Amp. for battery , 2 Nos.
MCB (AC)	: 6 Amp. AC output load protection & Grid Charging , 2Nos.
Fuse	: 10 Amp. for Individual protection of solar panel and battery ,4Nos
Banana Terminals	: 10 Amp. & 20 Amp. (shock proof connections)

List of Accessories

Patch Cards	: 20Amp. & 10 Amp.
Mains Card	: 2 Nos.
Wires	: 2.5 Square mm havells : Red – 30 meters : Black – 30 meters
Gravity Hydrometer	: 1 No.
BNC to BNC cable	: 1 No.
Glass Fuse 10Amp.	: 10 Nos.
Rheostat 100Ω/8Amp	: 1 No.

Technical Specifications

Solar Panel

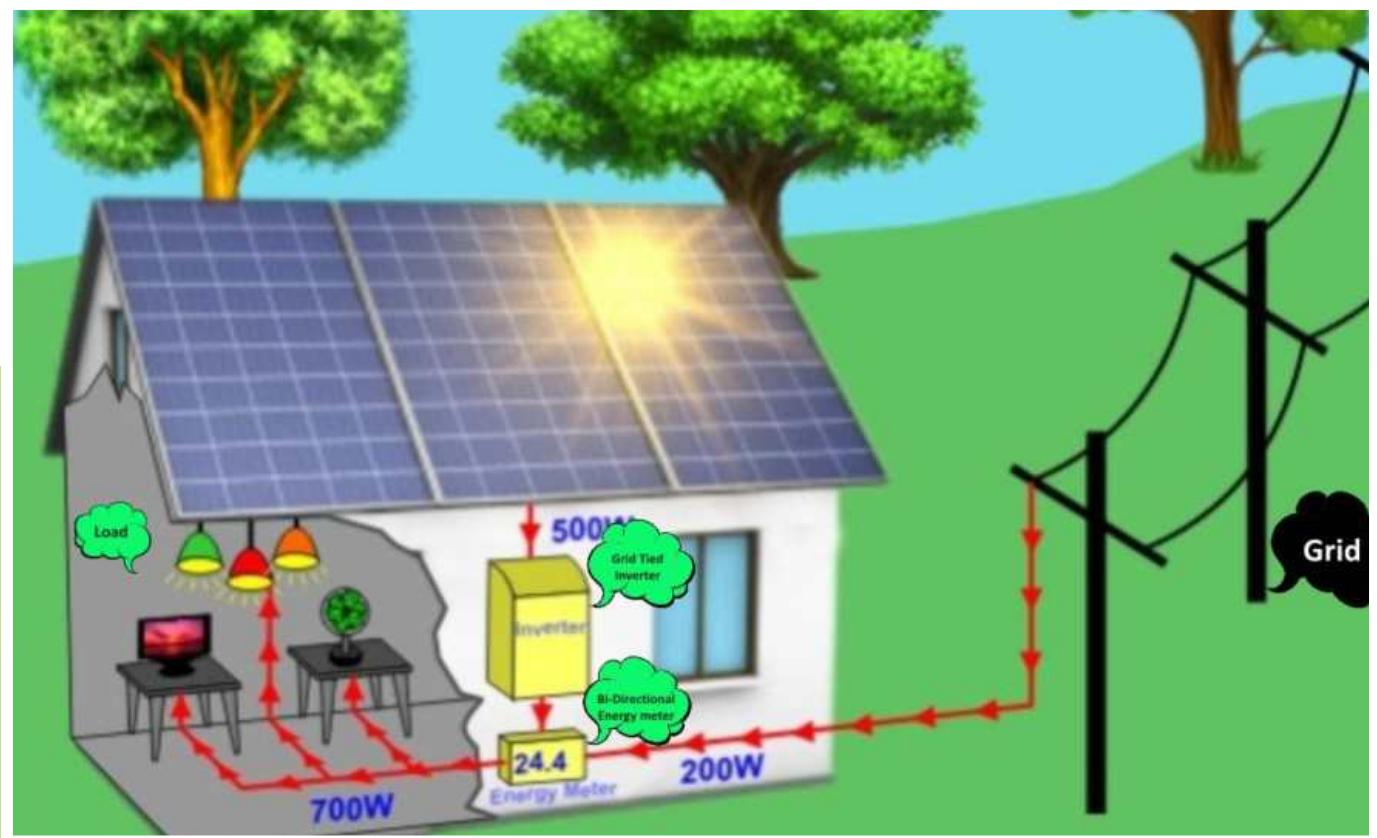
Make	: Waaree
Cell Type	: Poly (multi) crystalline
No. of Cells	: 72
Pm	: 250Wp
Voc	: 43V
Isc	: 7.75A
Vmp	: 35V
Imp	: 7.14A
Quantity	: 2Nos.

Inverter

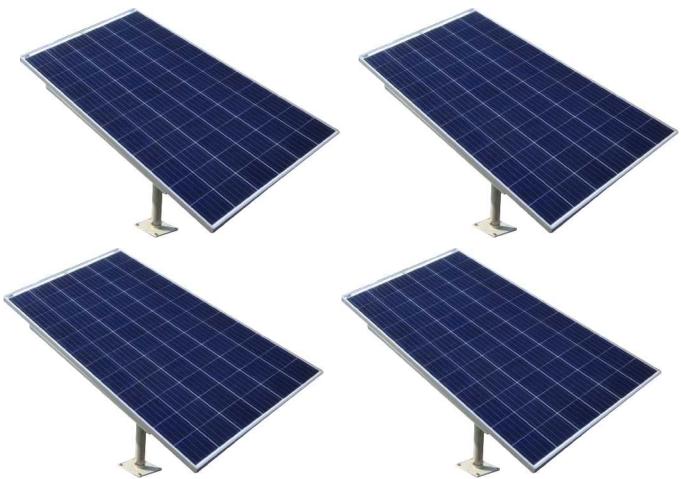
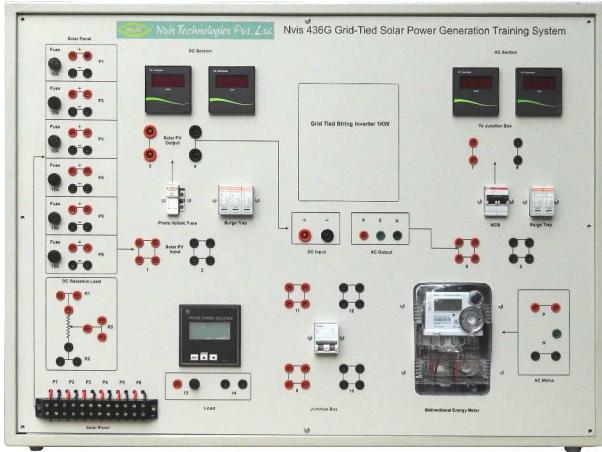
Capacity	: 500VA
DC Input voltage	: 24V
Input Voltage	: 190~260V AC
Output Voltage on Mains mode	: Same as input
Output Voltage on UPS mode	: 210~245V
Output Frequency on UPS mode	: 50Hz ±0.1Hz
Output waveform on Mains mode	: Same as input
Output waveform on UPS mode	: Modified Sine wave
Battery Charging Current	: 12A
Battery Charging Mode	: Solar and Grid
Efficiency at full load	: >80%
UPS Overload / UPS Short circuit	: Yes

Technology	: Microcontroller Based Design
LED Indication	: Mains ON, UPS ON, Low Battery, Charging & Over load

Solar Grid Tied Power Plant



Nvis Technologies Pvt. Ltd.



A grid-connected system allows people to power their home or business with renewable energy. Any excess electricity produced is fed back into the grid.

Power providers (i.e. electricity boards) in most states allow net metering, an arrangement where the excess electricity generated by grid-connected renewable energy systems "turns back" your electricity meter as it is fed back into the grid. If you use more electricity than your system feeds into the grid during a given month, you pay your power provider only for the difference between what you used and what you produced.

Nvis 436G Grid-Tied Solar Power Generation Training System is designed for training and understanding of complete technology of solar grid tied system. This system not only helps in developing the basic understanding of solar power generation but also helps user to understand the system designing and system installation. It demonstrates the reverse metering concepts along with fundamentals of Solar PV based power generation.

Features

- Manual tracking system.
- Built in DC/AC voltmeters and ammeters to read the voltage and current of Solar panel and system.
- Bidirectional energy meter demonstration.
- Multifunction meter to observe voltage, current, power, frequency, power factor and energy.

Scope of Learning

- To study grid tied solar power generation and its application.
- To study site assessment and planning before solar PV installation.
- Understand IV characteristics of solar panel.
- Understand the reverse metering technique.
- Understand the effect of tracking on solar power generation system.
- Understand effect of shadow on solar PV system.

Technical Specifications

Solar panel

Make	: Waaree/AMV/Emvee/any other equivalent
Cell type	: Poly (multi) crystalline
Solar power	: 1kW

Single phase grid tied inverter

Rated output power	: 1kW
Max DC input voltage	: 450V
Max DC input current	: 10A
MPPT operation range	: 50V-400V
Rating grid voltage	: 230Vac
Grid voltage range	: 180Vac-230Vac
Grid rating output current	: 4.3A
Rating grid frequency	: 50/60Hz
Topology	: Transformer less
Efficiency	: 96%
Protection	: DC reverse polarity, AC short circuit, Islanding, temperature, etc.

Digital meters

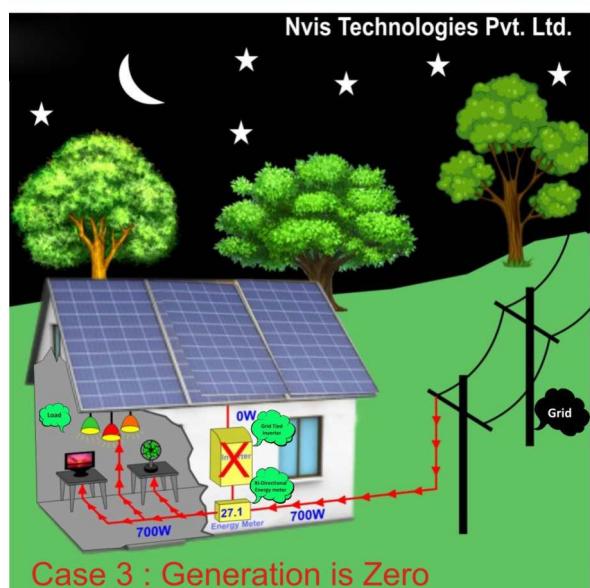
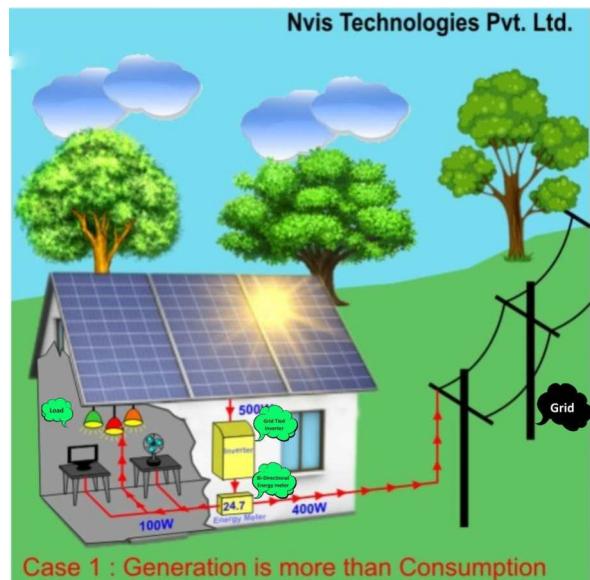
DC voltmeter	: 300V
DC ammeter	: 10A
AC voltmeter	: 415V
AC ammeter	: 10A
Bidirectional energy meter	: 1no.
Multifunction meter	: 1no.

Protection devices

DCDB (DC distribution box)	: 1no.
ACDB (AC distribution box)	: 1no.

Structure for Solar Panel

Material	: GI
Tracking type	: Manual
Assembly	: Detachable and easy to install
Load	: 1.2KW, resistive load (optional)
Rheostat	: 50Ω, 15A x 1 no. (optional)



Solar and Wind Hybrid Power Plant



Nvis Technologies Pvt. Ltd.



Hybrid Renewable Energy Systems are becoming popular as stand-alone power systems for providing electricity in remote & urban areas due to advances in renewable energy technologies and subsequent rise in prices of petroleum products. A hybrid energy system usually consists of two or more renewable energy sources used together to provide increased system efficiency as well as greater balance in energy supply.

Solar and Wind hybrid power plant is an integrated hybrid energy solution capable of harnessing both the sunlight on-site and wind energy available at low altitudes in urban and rural environment.

Nvis has designed 436SW Solar & Wind Hybrid Power Generation Training System to explain fundamentals of power generation and storage of Solar and Wind energy. This system includes controller-based digital measuring instruments for accurate results and protection devices for safety. It also includes an inbuilt Inverter which can be operated with both mains and through batteries. Users can easily understand how to configure Hybrid Solar & Wind system to get the maximum electrical energy for domestic and industrial use.

Features

- A Hybrid system for power generation and learning concepts.
- Equipped with Hybrid Solar & Wind charge controller with overload and low battery protection.
- Designed considering all safety measures.
- Specially designed patch cords for extra safety.
- Highly accurate microcontroller-based measuring instruments.
- Equipped with multifunction meter to analyze output parameters.
- System is flexible to operate on mains as well as inverter mode.
- Solar technology learning software

Hybrid charge controller

Quantity	: 1no.
Voltage	: 24V
Protection	: Overload and low-battery protection

Hybrid Inverter

Capacity	: 1000VA
Input Voltage	: 190~260V
Output voltage	: 210~245V (inverter mode)
Output frequency	: 50Hz ±0.1Hz (inverter mode)
Output waveform	: Modified sine wave (inverter mode)

Efficiency at full load: >80%

Protection	: Overload & short circuit
Technology	: Microcontroller based design

Digital meters

AC voltmeter	: 500V
AC ammeter	: 10A
DC voltmeter	: 300V
DC ammeter	: 40A

AC multifunction meter

Measurements	: AC voltage, AC current, Frequency, Power, kWh
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Optional accessories

AC/DC Load (Nvis 726)
Blower for wind turbine (Nvis BL01)

Scope of Learning

- Study of hybrid charge controller.
- Analysis of the effect of dust on solar PV module.
- Analysis of the effect of temperature on solar PV module.
- Study of safety and precaution for Solar system and Wind turbine installation.
- Study of solar & wind (hybrid) power generation.

Technical Specifications

Solar Panel

Power rating	: 250Wp(4nos.) or 330Wp (3nos.)
Cell type	: Poly (multi) crystalline

Solar battery	: 4nos.
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Capacity	: 100Ah
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Type	: C10
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Wind Turbine

Power rating	: 300Watt
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Generator output	: 24V
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Blades	: 3nos.
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Rotor	: Three FRP blades along with standard steel nut-bolts & GI coated turbine
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Structure	: 5ft, MS structure with floor stand
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Solar Water Pump



Nvis Technologies Pvt. Ltd.



Nvis 439 Solar Water Pump Demonstrator is designed to provide training to the student for learning of basic concept of solar pumping. To ensure nonstop irrigation in all weather conditions MPPT technology has been used. In commercial pumps.

Nvis Solar Water Pump includes Solar Panels, Solar MPPT Drive, Water Pump. It contains all necessary protections like Dry run protection. To ensure long life and continuous operation of system. This is a complete model to explain the topic and perform various lab experiments.

Features

- Ideal for remote areas where grid supply is not available
- Soft Start of motor pump to increase its life
- Works on Solar
- Compatible with surface pump
- Suitable for Day time irrigation
- Latest Technology
- MPPT Technology
- Equipped with all necessary protections
- Environment Friendly

Technical Specifications

Pump type	:	Surface DC Pump
Operation	:	Solar DC
Solar Panel	:	1 kWp
Structure	:	GI
Water Pump	:	1 HP

Solar PV

Interactive Software



Nvis Technologies Pvt. Ltd.

Simtel Interactive Technology Learning Platform" has been made to strengthen students technical knowledge and develop a deep understanding of technology. Its two dimensional and three dimensional (2D and 3D) graphical approach will help learner to grasp subjects in a very short period of time with great clarity. Simtel modules focus on fundamental to latest topics specifically designed for students, teachers, and training institutes. Teachers can also use Simtel modules in their classroom and make their lecture more interactive and effective using interactive Graphical User Interface (GUI), user friendly and easy navigation, detailed theory, explanation of complex topics with animations and user interactive simulations.

Topics:

Renewable Energy

- Water Energy
- Wind Energy
- Sun's Energy
- Biomass Energy
- Geo Energy

Basic Electrical & Electronics

- Fundamentals of Semiconductors
- Charge Carriers and Their Motion in Semiconductor
- P-N Junction Diode
- Ohm's Law

Solar Energy

- Solar Thermal Energy
- Solar Photovoltaic Energy

Solar Radiation

- Solar Spectrum at the Earth's Surface
- The Sun and Earth Movement
- Angle of Sunrays on Solar Collector
- Sun Tracking
- Measurement of Solar Radiation

Photovoltaic

- Design of Solar Cells
- Solar PV Modules from Solar Cells
- Mismatch in Series Connection
- Mismatching in parallel Connection
- Design and Structure of PV Modules
- PV Module Power Output

Solar PV System

- Batteries for PV System
- DC to DC Converters
- Charge Controllers
- DC to AC Converters (Inverter)
- Maximum Power Point Tracking (MPPT)

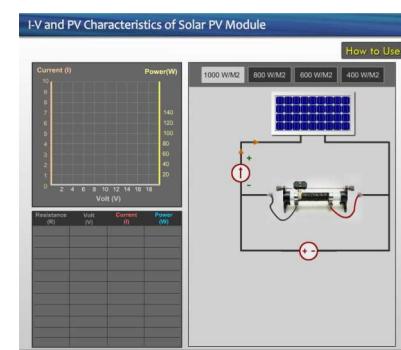
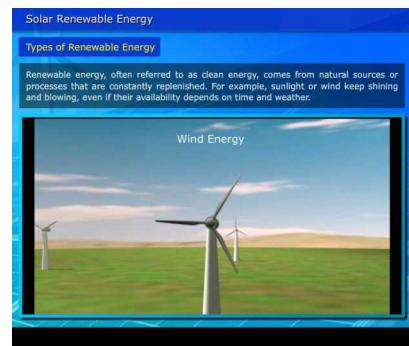
PV System Design

- Introduction to Solar PV Systems
- Stand-alone PV System Configurations
- Design Methodology of PV Systems

Solar PV Application

- Hybrid PV System
- Grid-Connected PV System
- Life Cycle Costing (LCC)

Software program windows



Designed & Manufactured in India by

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