



**Karunya** INSTITUTE OF TECHNOLOGY AND SCIENCES

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

MoE, UGC & AICTE Approved; NAAC Accredited A++

Karunya Nagar, Coimbatore - 641 114, Tamil Nadu, India.

**DIVISION OF ELECTRONICS AND COMMUNICATION ENGINEERING**

# **ELECTRONICS LABORATORY**

## 1. DSO with Function Generator



<b>Make</b>	Hantek
<b>Model</b>	DSO2D10
<b>Features</b>	<ul style="list-style-type: none"> <li>• 8M memory depth</li> <li>• Built-in 1 CH 5MHz waveform generator</li> <li>• 2 channels, both are respectively controlled by independent knobs</li> <li>• 100 MHz, 150MHz analog channel bandwidth</li> <li>• 1 GSa/s real-time sample rate</li> </ul>

### Applications

- Electronics Testing and Debugging
- Research and Development
- Education
- Embedded Systems Development
- Telecommunications
- Power Electronics
- Automotive Diagnostics

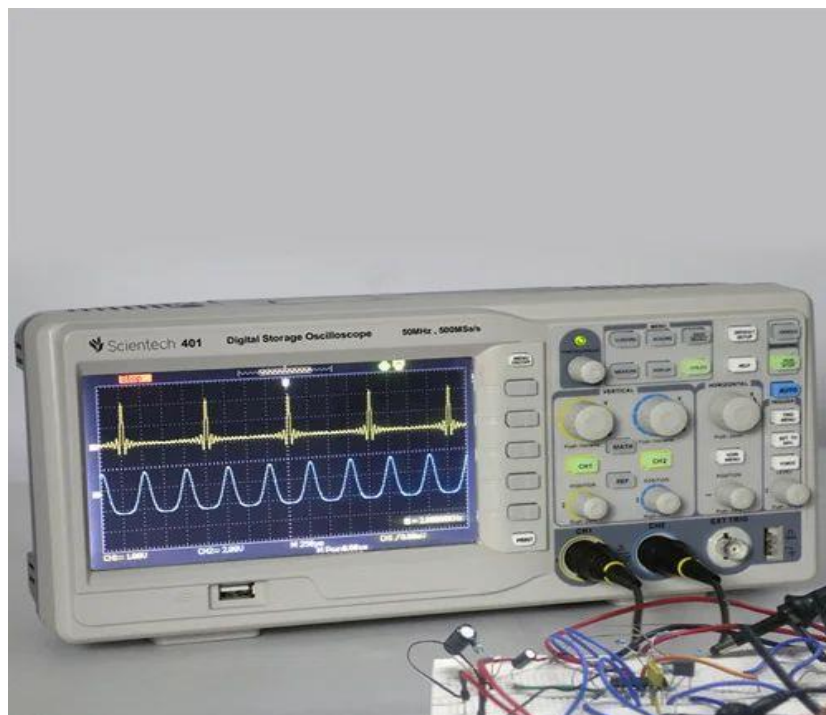
## 2. Function Generator 3MHz



### Features:

- Frequency Range 0.3Hz to 3MHz
  - 15MHz Frequency Counter and Digital Frequency Readout (5 digit)
  - Wave forms: Sine, Square, Triangle, DC-Offset Adjustment.
  - Internal Sweep & External FM-Modulation and TTL Trigger Output
  - Low Distortion High Resolution on Frequency Output Attenuation upto 80dB
  - Variable DC Offset Control
  - Four Digit digital Display with Frequency Indication in Hz, KHz, MHz/Amplitude display
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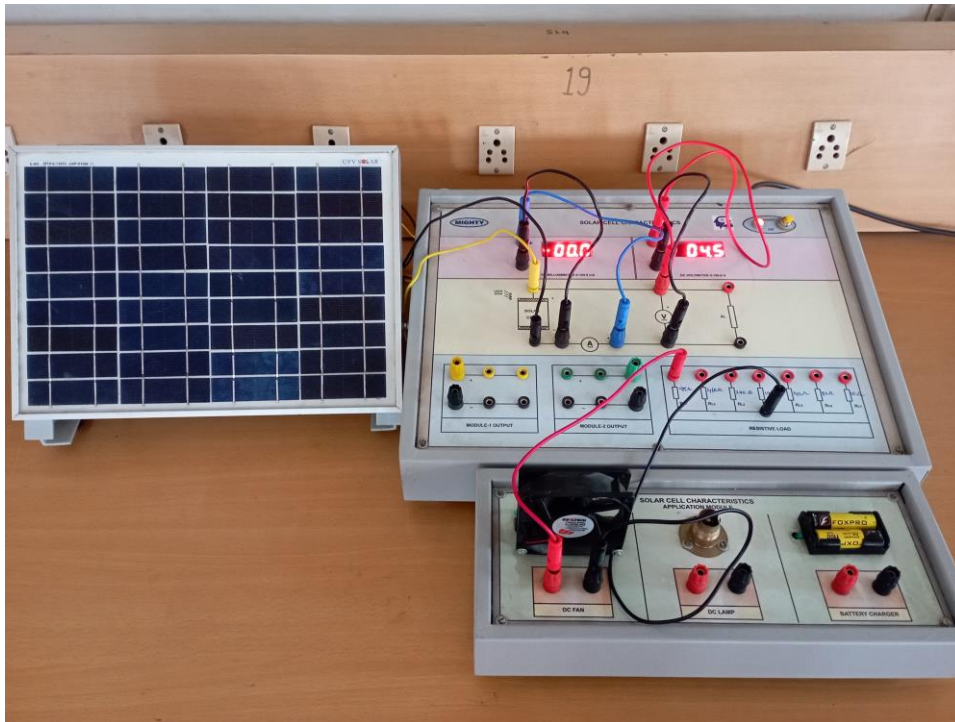
### 3. DIGITAL STORAGE OSCILLOSCOPE 50MHz



#### Features:

- Bandwidth 50MHz
  - Real-time Sampling Rate 500 MSa/s, Equivalent Sampling Rate 50GSa/s.
  - Memory Depth: 32Kpts
  - Trigger types: Edge, Pulse width, Video, Slope, Alternative
  - Unique Digital Filter function and Waveform Recorder function
  - Support pass/fail function.
  - 32 parameters Auto Measure function
  - Save/recall types: Setups, Waveforms, CSV files, Picture
  - Waveform Intensity and grid brightness can be adjusted
-

## 4. Solar Cell Kit



### SOLAR CELL CHARACTERISTICS

#### I. Solar PV Module Specifications

Rated Power Output	:	10 W
Open Circuit Voltage $V_{OC}$	:	21.6 V
Short Circuit Current $I_{SC}$	:	0.60 A
Rated Voltage $V_{mpp}$	:	18.0 V
Rated Current $I_{mpp}$	:	0.56 A

#### Application Modules

Fan -1 no

#Rating:DC 12V

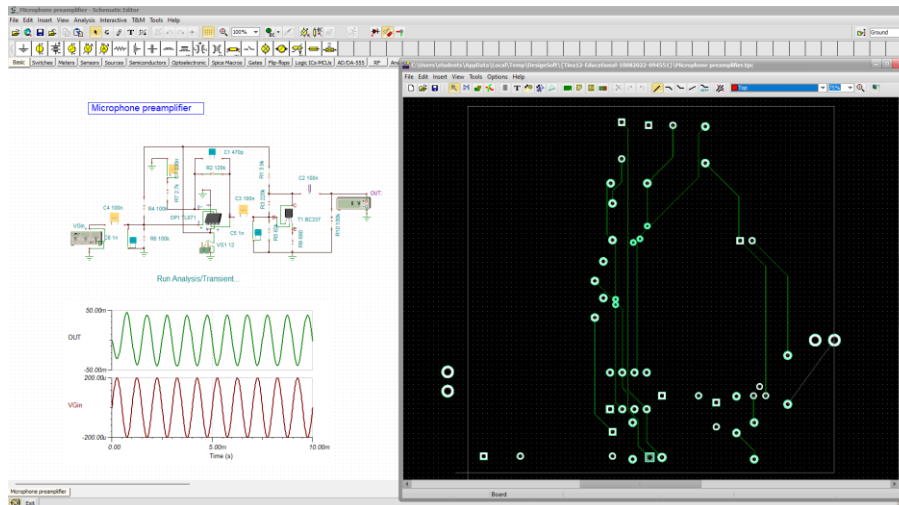
Lamp -1 no

#Rating: DC 12V

DC Battery Charger-1 no

#Rating : DC 12V

## 5. TINA Design Suite V12



<b>License Type</b>	Perpetual
<b>No. of Users</b>	100
<b>Tools Available</b>	<ul style="list-style-type: none"> <li>• Circuit Simulator for Analog, Digital, MCU and RF Circuits</li> <li>• Integrated PCB Design</li> <li>• 3D view / Live Breadboard view</li> </ul>

TINA Design Suite is a powerful yet affordable circuit simulator, circuit designer and PCB design software package for analyzing, designing, and real time testing of analog, digital, IBIS, HDL, MCU, and mixed electronic circuits and their PCB layouts. You can also analyze SMPS, RF, and communication and optoelectronic circuits; generate and debug MCU code using the integrated flowchart tool; and test microcontroller applications in a mixed circuit environment.

TINA is one of the most powerful and best converging Spice simulator on the market. It includes both Berkely Spice and XSpice based Spice engines, supports most Spice dialects with parallelized processing and precompiled models.

### Applications

- Circuit Design and Simulation
- PCB Layout Design
- Multi-Layer PCB design
- Exporting the design file to System Job format
- Layout preparation for manual development process





Design and Development of a Low-Cost Medical Glove for Hand Tremor Management Caused by Parkinson's Disease

Status: Completed

Funding Agency  
Indian Council of Medical Research



A Low-cost Medical glove

to Reduce the hand tremor caused by Parkinson's disease.



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Assistive Methodologies for Parkinson's Disease Tremor Management—A Health Opinion

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Keywords: Parkinson's disease, assistive devices, tremor, postural instability, non-invasive

INTRODUCTION

Parkinson's disease makes lives challenging every day due to the evolving and progressive motor symptoms such as tremors, slow movements, postural instability, and stiffness. These physical symptoms can then in turn affect the thoughts, leading to a state of depression. Tremor is an involuntary, unintended, periodic movement of the muscle of one or more parts of the body and can affect the head, legs, or arms, but predominantly affects the hands. This paper provides an overview on controlling the Parkinson's tremor in the hand through assistive methodologies. Non-invasive low cost assistive devices are considered to reduce the hand tremor caused by Parkinson's disease. Artificial intelligence tools offer insights to evaluate speech disorders of Parkinson's patients. It can also identify them based on facial expressions.

PARKINSON'S—IN THE PERSPECTIVE OF HEALTH

Parkinson's is a neurodegenerative disorder (1, 6, 15) that occurs due to the death of dopaminergic neurons (15). Electrophysiology is a way to examine the patients in the way of past events and physical exams. Our paper aims to provide a detailed survey on Parkinson's tremors and the ways that they can be detected (1), controlled (5, 15, 17), and analyzed (5, 17). The assessment of Parkinson's disease is based on the clinical interview, the physical examination, and structured instruments (15). Drawbacks to the use of clinical ratings include the reliance on real-time human vision to quantify small differences in motion and significant inter-rater variability due to inherent subjectivity in scoring the procedures. Tremor is an involuntary, unintended, periodic movement of the muscle of one or more parts of the body that can affect the head, legs, arms, and predominantly the hands. Parkinson's tremor can be detected with the help of the active particular muscles in the hand at the time of movement (1, 22). To detect the tremor, the subject should sit in a comfortable place and rest their hands (1). The hand tremor in Parkinson's disease is a periodic signal which has a frequency range (1–5 Hz) where the number of oscillations per time can be noted. The frequency can be calculated manually in the time domain by the total number of cycles per second. But it is not an easy task in the case of random signals with many frequencies. To study the tremor in the human body, knowledge about the natural frequency is very important. Based on the physical properties, each part of the body will oscillate based on its resonance. The oscillation is like a

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Automatic glove inflation and deflation system

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