PC Based Instrumentation for Electrical Fundamental

Designed to combine a complete set of instruments into a flexible and programmable device, the ADP5250 features a mixed-signal oscilloscope with two 100 MHz bandwidth, 1 GS/s analog channels, 34 digital channels, a tri-output power supply capable of up to 25 V, an external trigger.

Recommended Lab : Electrical Fundamental

Redefines how the core electrical engineering topics of circuits, electronics, and signals and systems are taught with an innovative, breadth-first approach. They follow a systematic approach that gradually deepens a student's understanding while keeping individual laboratories manageable.

Prerequisites

- Experience with electronics sensors & actuators

Products Used

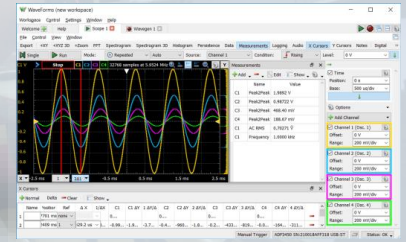
- Analog Discovery Pro
- WaveForms
- MultisimLive
- Accessories Kits (Optional)

Lab Compatibility :

Analog Lab, Digital Lab, Power Electronics Lab, Measurement Lab, Instrument Lab.

Key Features :

- Analog Inputs and Outputs: 2 channels each with ±40 V range and 8-bit resolution.
- Digital Inputs/Outputs: 32 channels for working with digital logic signals.
- Oscilloscope: 100 MHz bandwidth, 1 GS/s sample rate.
- Arbitrary Waveform Generator: Generates various waveforms up to 36 MHz with ±12 V amplitude.
- Network Analyzer: Measures impedance over the frequency Sweep range of 1 MHz to 10 MHz.
- Spectrum Analyzer: Analyzes frequency components up to 100 MHz.
- Digital Bus Protocol Analyzer: Supports I2C, SPI, UART/RS-232, and CAN.
- Data Logger: Buffer size of 1 MS per channel for data recording.
- Connectivity: USB 2.0 interface for easy connection to a computer.
- Software Support: Controlled via the user-friendly WaveForms software suite.
- **Include Accessories & Components for Electrical Fundamental Lab**



PC Based Instrumentation for Electrical Fundamental Lab

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(021) 2217-8880

sales@haliatech.com

Compact USB Oscilloscope for Basic Electronics & Circuit

Digital oscilloscope, logic analyzer, waveform generator, pattern generator, and much more. Using the flexible WaveForms software (supported by Windows, Mac, and Linux), the Analog Discovery 3 can be used in the lab, in the field, or even at home - you're no longer tied down to a traditional benchtop and stacks of expensive test instruments.

Recommended Lab : Basic Circuit & Electronics

Redefines how the core electrical engineering topics of circuits, electronics, and signals and systems are taught with an innovative, breadth-first approach. They follow a systematic approach that gradually deepens a student's understanding while keeping individual laboratories manageable.

Prerequisites

- Experience with electronics sensors & actuators

Products Used

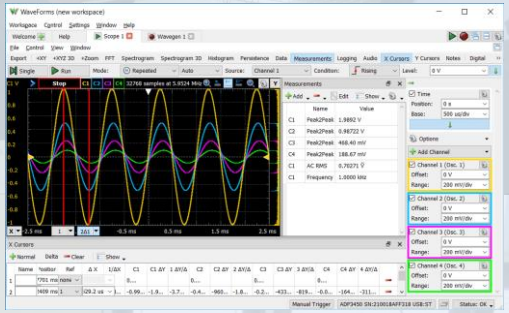
- Analog Discovery 3
- Accessories Kit
- Multisim

Lab Compatibility :

Analog Lab, Digital Lab, Power Electronics Lab, Measurement Lab, Instrument Lab.

Key Features :

- Analog Outputs: 2 channels, ±5 V range, 14-bit resolution, up to 100 MS/s update rate.
- Digital Inputs/Outputs: 16 channels, 3.3 V and 1.8 V logic thresholds.
- Waveform Generator: 12 MHz frequency range, ±5 V amplitude.
- Oscilloscope: 30 MHz bandwidth, ±50 V max input, 8192-sample buffer, various trigger types.
- Spectrum Analyzer: 100 Hz to 10 MHz frequency range, -50 dBV to +10 dBV amplitude range.
- Network Analyzer: 1 Hz to 10 MHz frequency range, impedance measurement (10 Ohms to 5 kOhms) with ±2% accuracy.
- Digital Pattern Generator: Up to 32767-bit patterns, 100 MS/s max output rate, up to 50 MHz pattern rate.
- Data Logger: 4096-sample buffer.
- Connectivity: USB 2.0 interface.
- Software Support: Controlled via the user-friendly WaveForms software suite.
- **Include Accessories & Components for Basic Circuit & Electronics Lab**



Compact USB Oscilloscope for Measurement Lab

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Fundamental Teaching Lab with Benchtop Instruments

Prepare future engineers for tomorrow's exciting challenges with an affordable yet powerful suite of entry level test equipment. This bench configuration includes the hardware, software and service components to give your students the engineering fundamentals they need.

Recommended Lab : Basic Circuit & Electronics

Redefines how the core electrical engineering topics of circuits, electronics, and signals and systems are taught with an innovative, breadth-first approach. They follow a systematic approach that gradually deepens a student's understanding while keeping individual laboratories manageable.

Prerequisites

- Experience with electronics sensors & actuators

Products Used

- TBS1000C
- DMM6500
- Power Supply
- AFG1062

Lab Compatibility :

Electronics Lab, Analog Lab, Digital Lab, Rapid Prototyping, Embedded Lab, Data Acquisition Lab, Power Electronics Lab.

1. TBS1000C Oscilloscope
   One probe per channel included.
2. DMM6500 Digital Multimeter
3. 2231A-30-3 Power Supply
4. AFG1062
   Arbitrary Function Generator

Key Features :

- TBS1000C includes a 7-inch WVGA color display with up to 1 GS/s sample rate, bandwidths from 50 MHz to 200 MHz.
- DMM6500 is a highly accurate and versatile digital multimeter with 15 Built-in measurement function & 16-bit digitizer
- 2231A-30-3 Power Supply with two channels can supply up to 30V at 3A each; the third channel can provide up to 5V at 3A.
- AFG1062 with 25MHz or 60MHz bandwidth, 2 output channels, 1 mVpp to 10 Vpp output amplitude across full bandwidth.
- **Include Accessories & Components for Basic Circuit & Electronics Lab**

Reliable & High-Quality Benchtop Instruments from Tektronix to make sure your students and the world's future engineers have the right tools for today and tomorrow.

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Complete Lab Test Bench Instrument with Remote Capability

Smart Bench Essentials is a complete lab test bench solution. With a 30-Watt triple-output power supply, single- or dual-channel 20 MHz function generators, a 5.5-digit digital multimeter, and a 50 MHz oscilloscope, the Smart Bench Essentials has everything needed for a basic electronic workbench, plus powerful software that integrates measurement and analysis across the portfolio.

Recommended Lab : Basic Circuit & Electronics

Redefines how the core electrical engineering topics of circuits, electronics, and signals and systems are taught with an innovative, breadth-first approach. They follow a systematic approach that gradually deepens a student's understanding while keeping individual laboratories manageable.

Prerequisites

- Experience with electronics sensors & actuators

Products Used

- Keysight Smart Bench Essentials
- PathWave Software

Lab Compatibility :

Electronics Lab, Analog Lab, Digital Lab, Rapid Prototyping, Embedded Lab, Data Acquisition Lab, Power Electronics Lab.

Key Features :

- Up to 20 MHz Frequency Range Dual-channel function generators with six built-in modulation types, and 16-bit arbitrary waveform.
- 2 Channels of 30V / 1A and 1 Channel of 6V / 5A PSU with three electrically isolated channels with a total of 90 W clean and reliable power.
- Dual display 5.5-digit digital multimeter with up to 110 readings/s
- 50 MHz Bandwidth Proven InfiniiVision technology that gives you professional-level measurement
- **Include PathWave Software & Keysight Certification.**

PathWave Remote Lab Access and Lab Management software applications provide complete remote setup of your basic electronic test equipment with web-based lab management and scheduling administration, instrument control, and remote access for measurement and analysis

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RevPi For IIoT

This platform provides a comprehensive IIoT solution with data collection, analysis, action, and insight. Data is collected with Kunbus's RevPi, an open, modular and inexpensive industrial PC based on the well-known Raspberry Pi. Housed in a slim DIN-rail housing, the three available base modules can be seamlessly expanded by a variety of suitable I/O modules and fieldbus gateways.

Recommended Lab : IIoT Lab

The IIoT (Industrial Internet of Things) Lab is a specialized facility dedicated to exploring, developing, and testing technologies related to the Industrial Internet of Things. It focuses on the integration of advanced sensors, data analytics, cloud computing, and machine-to-machine communication to optimize industrial processes and improve efficiency.

Prerequisites

- Basic knowledge of programming text or graphical
- Basic knowledge of embedded system
- Experience with electronics sensors & actuators

Products Used

- RevPi Core
- RevPi IO & DIO
- Python IDE
- LabVIEW AVL (Optional)
- Humidity Chamber(Optional)

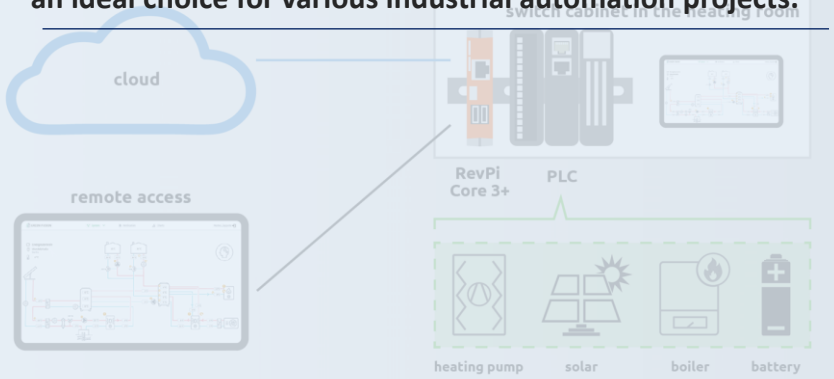
Lab Compatibility :

IoT Lab, Basic Data Acquisition Lab, Industrial Communication Lab, Embedded Lab.

Key Features :

- Industrial Standards: Despite its Raspberry Pi compatibility, Revolution Pi is engineered for industrial environments and meets various industrial standards, ensuring reliability and durability.
- Industrial Inputs and Outputs: The platform offers a wide range of digital and analog inputs and outputs to interface with industrial sensors, actuators, and devices.
- Industrial Communication Protocols: The platform supports various industrial communication protocols, such as PROFINET, Modbus, and MQTT, facilitating seamless integration with existing industrial systems.
- Remote Access and Monitoring: Revolution Pi supports remote access and monitoring, enabling users to manage and monitor their IIoT systems from anywhere.
- Expandable and Scalable: Users can expand and scale their Revolution Pi systems by adding additional modules to meet growing requirements.
- Community and Support: Revolution Pi has an active community of users and developers, providing support, resources, and a platform for sharing ideas and solutions.

Revolution Pi is a powerful and flexible IIoT platform that combines the simplicity of the Raspberry Pi with the robustness and reliability required for industrial automation applications. It empowers users to build tailor-made IIoT solutions that suit their specific needs, making it an ideal choice for various industrial automation projects.



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RevPi For Industrial Automation

This platform provides a comprehensive IIoT solution with data collection, analysis, action, and insight. Data is collected with Kunbus's RevPi, an open, modular and inexpensive industrial PC based on the well-known Raspberry Pi. Equipped with PLC Training Board & CODESYS Software, this product very suitable to learn about industrial automation.

Recommended Lab : Automation Lab

Designed to provide a comprehensive understanding of industrial automation, from basic concepts to practical implementation. Through hands-on projects and case studies, students gain valuable experience in applying the Revolution Pi platform to solve real-world automation challenges, preparing them for careers in the field of industrial automation and IoT.

Prerequisites

- Basic knowledge of programming text or graphical
- Basic knowledge of embedded system
- Experience with electronics sensors & actuators

Products Used

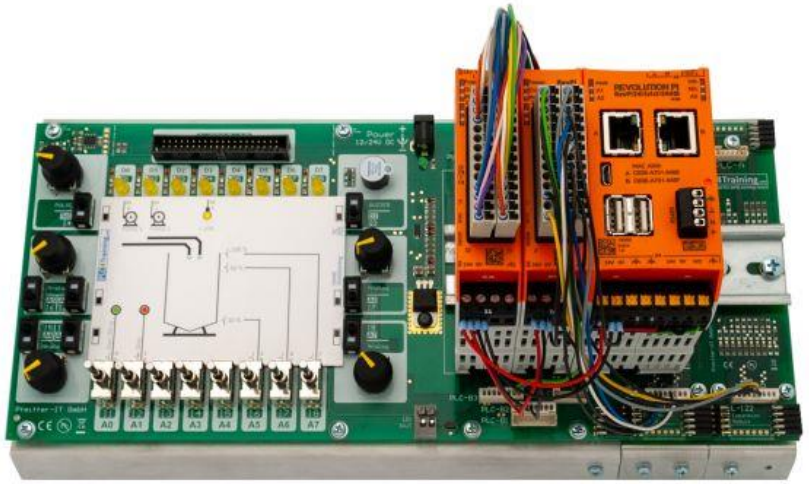
- RevPi Connect SE
- RevPi IO & DIO
- PLC Training Board
- Python IDE

Lab Compatibility :

Control Lab, Basic Data Acquisition Lab, Industrial Communication Lab, Embedded Lab.

Key Features :

- Industrial Standards: Despite its Raspberry Pi compatibility, Revolution Pi is engineered for industrial environments and meets various industrial standards, ensuring reliability and durability.
- Industrial Inputs and Outputs: The platform offers a wide range of digital and analog inputs and outputs to interface with industrial sensors, actuators, and devices.
- Industrial Communication Protocols: The platform supports various industrial communication protocols, such as PROFINET, Modbus, and MQTT, facilitating seamless integration with existing industrial systems.
- Remote Access and Monitoring: Revolution Pi supports remote access and monitoring, enabling users to manage and monitor their IIoT systems from anywhere.
- Expandable and Scalable: Users can expand and scale their Revolution Pi systems by adding additional modules to meet growing requirements.
- Community and Support: Revolution Pi has an active community of users and developers, providing support, resources, and a platform for sharing ideas and solutions.



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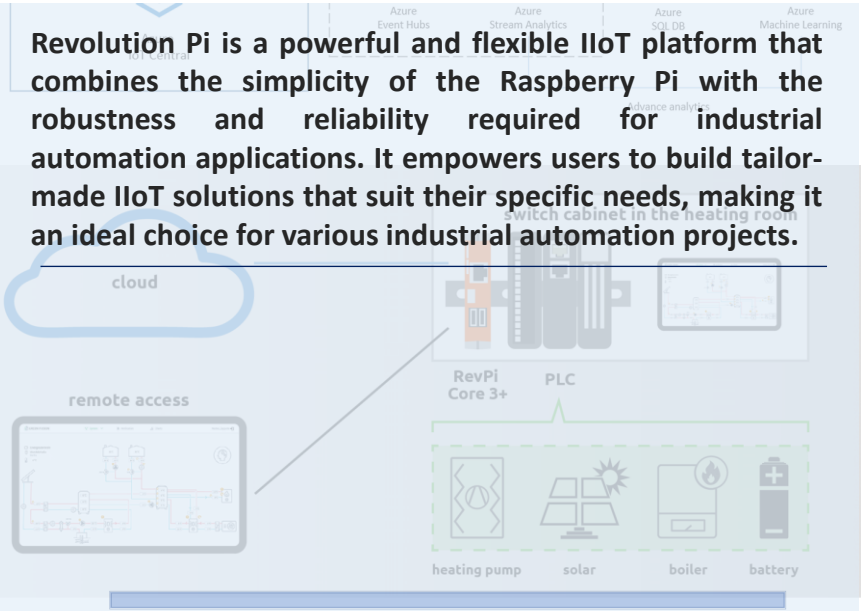

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USRP Software Defined Radio

Software Defined Radios are RF transceivers that enable rapid prototyping and deployment of advanced wireless applications. SDRs are used for wireless communications, deploying signals intelligence systems, or as building blocks for multichannel test beds.

Recommended Lab : Intro to Communication Lab

Introductory course in communication systems offered at the junior or senior level in an electrical or computer engineering program. The lab exercises use the NI USRP software defined radio platform; no additional laboratory equipment is needed, other than a computer to run LabVIEW Communications and to interface with the USRP.

Prerequisites

- Have basic signals & systems knowledge

Products Used

- USRP 2920
- Vert400 Vertical Antenna
- LabVIEW AVL

Lab Compatibility :

Wireless Communication Lab, SDR Lab, Satellite Communications Lab, Radar System Lab, Wireless Sensor Networks Lab.

Key Features :

- Covers a wide frequency range from 50 MHz to 2.2 GHz
- Supports a maximum bandwidth of up to 40 MHz
- Can operate with two full-duplex channels, allowing simultaneous transmission and reception of signals.
- Transmit power with a range of up to 20 dBm, allowing adjustable output power levels for different applications.
- Include an onboard FPGA for real-time signal processing and customization.
- Two SMA antenna connectors for connecting external antennas for both transmit and receive.
- Fully compatible with the UHD (USRP Hardware Driver) and GNU Radio, providing a flexible and open-source environment for SDR development.
- Can be used in MIMO configurations, enabling advanced research and communication experiments.
- **Include LabVIEW Academic Volume Licenses.**

USRP 2920's wide frequency range, dual-channel operation, FPGA processing capabilities, and USB 3.0 connectivity make it a versatile SDR platform suitable for various wireless communication, research, and educational applications.

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FPGA Trainer Board

Complete and ready-to use digital circuit development platform, it includes enough switches, LEDs, and other I/O devices to allow a large number of designs to be completed without the need for any additional hardware. There are also enough uncommitted FPGA I/O pins to allow designs to be expanded using Digilent Pmods or other custom boards and circuits, and all of this at a student-friendly price point.

Recommended Lab : Digital Design Lab

A digital design lab is a practical learning environment where students and engineers can gain hands-on experience in designing, testing, and implementing digital logic circuits and systems.

Prerequisites

- Basic Digital electronics knowledge
- Basic programming skills

Products Used

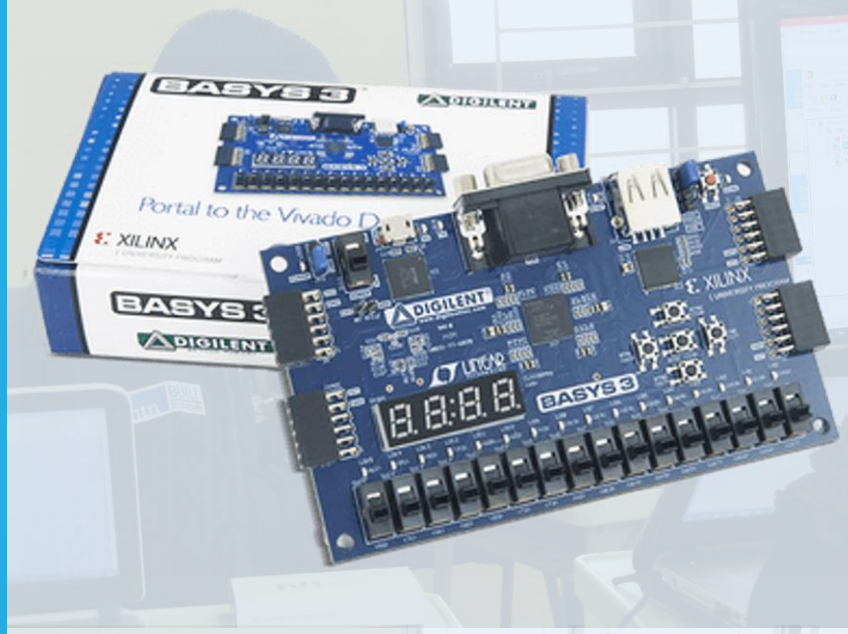
- Basys 3

Lab Compatibility :

FPGA Design Lab, Embedded Systems Lab, Digital Signal Processing Lab, System-on-Chip Lab

Key Features :

- Xilinx Artix-7 FPGA with programmable logic cells, DSP slices, and memory blocks, offering a balance between performance and power efficiency.
- Provides a large number of logic cells, configurable as combinational logic or registers, allowing for complex digital designs.
- Has built-in block RAM and distributed RAM, providing on-chip memory resources for data storage and processing.
- Clock input and built-in clock management resources, enabling precise timing control for synchronous digital circuits.
- Provides various digital input and output pins, as well as analog input channels, facilitating interfacing with external devices and sensors.
- Has a USB-UART bridge, providing a convenient interface for communication between the FPGA and a computer.
- Includes Pmod connectors, allowing easy integration with a wide range of peripheral modules for additional functionality.
- VGA and HDMI Interfaces: It features VGA and HDMI connectors for connecting displays, making it suitable for creating video-based projects.



The Basys 3 is an FPGA development board with a Xilinx Artix-7 FPGA, providing versatile logic cells, memory, digital and analog I/O, and various interfaces like USB, VGA, and HDMI. It's user-friendly and suitable for educational projects and digital design experiments.

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PC Based Compact & Mixed Signal Oscilloscope

PC Based PicoScope 2205A is a Mixed Signal Oscilloscope from Pico Technology. It is a compact and affordable oscilloscope with a bandwidth of up to 25 MHz and a maximum sampling rate of 200 MS/s with 2 analog channel & 16 digital channel.

Recommended Lab : Basic Circuit & Electronics

Redefines how the core electrical engineering topics of circuits, electronics, and signals and systems are taught with an innovative, breadth-first approach. They follow a systematic approach that gradually deepens a student's understanding while keeping individual laboratories manageable.

Prerequisites

- Basic Digital electronics knowledge

Products Used

- PicoScope 2205A
- PicoScope Software

Lab Compatibility :

Electronics Lab, Analog Lab, Digital Lab, Rapid Prototyping, Basic Power Electronics Lab, Measurement Lab

Key Features :

- Mixed Signal Oscilloscope with 2 analog channel & 16 digital channel.
- Bandwidth of up to 25 MHz, which determines the range of frequencies it can accurately measure.
- Maximum sampling rate of 200 MS/s enabling it to capture fast-changing signals with good resolution.
- 8-bit vertical resolution, providing a range of 256 digital levels to represent the amplitude of the signals.
- It connects to a computer or laptop via USB, simplifying setup and eliminating the need for additional power supplies.
- Provides various triggering options, including edge, pulse width, window, and logic triggering.
- Comes with Free PicoScope software, to control the oscilloscope, view waveforms, and perform analysis, serial protocol decoding for digital communication protocols like I2C, SPI, UART, CAN, and more.
- Include advanced features such as spectrum analysis, waveform averaging, and automated measurements.

PicoScope 2205A is a powerful and versatile mixed-signal oscilloscope, combining analog and digital signal analysis capabilities in a single device. It is suitable for a wide range of applications, from basic analog signal analysis to advanced debugging of digital and mixed-signal systems.

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Versatile Data Acquisition Device for Education

NI myDAQ (National Instruments myDAQ) is a versatile data acquisition device designed for educational purposes and hands-on learning in various engineering disciplines. It combines analog and digital I/O capabilities, making it suitable for a wide range of labs.

Recommended Lab : Digital Electronics Lab
Hands-on experience in designing, building, and testing digital circuits. In this lab, the focus is on understanding and experimenting with digital logic elements, sequential circuits, and other components used in digital systems.

Prerequisites

- Experience with electronics sensors & actuators

Products Used

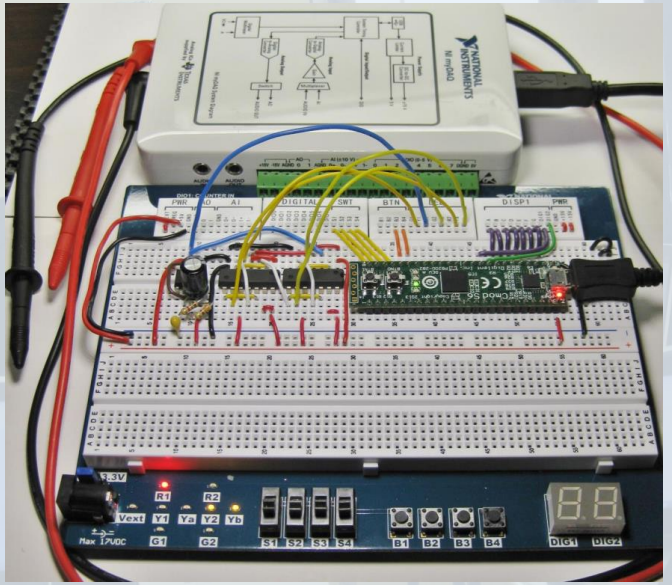
- NI myDAQ
- LabVIEW
- Multisim
- myDigital Protoboard for NI & myRIO

Lab Compatibility :

FPGA Design Lab, Embedded Systems Lab, Digital Signal Processing Lab, System-on-Chip Lab

Key Features :

- Provides a wide range of data acquisition capabilities, including analog inputs, analog outputs, digital I/O, and microphone input.
- Offers 2 analog input channels and 2 analog output channels with 16-bit resolution, enabling precise measurement and control of analog signals.
- Include 8 digital I/O lines, allowing interfacing with digital sensors and logic circuits.
- Digital Multimeter with multiple function to measure DC voltage, AC voltage, AC current, resistance, diode & continuity.
- Voltage Measurement from 200 mv up to 60 VDC/200 mVrms 20 Vrms with 3.5 digits resolution.
- Compact and USB-powered design makes it portable and easy to use with laptops and computers.
- Seamless integration with LabVIEW software enhances data analysis and control capabilities.
- **Includes myDigital Protoboard, LabVIEW & Multisim Student Edition.**



NI myDAQ's versatility, portability, and easy integration with LabVIEW make it a valuable tool for educators and students interested in exploring a wide range of engineering disciplines

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Analog Circuits Fundamental Trainer Kit

This analog circuits fundamental trainer kit covers the fundamental concepts of circuit theory and analysis. Through calculation, simulation in Multisim Live, and real-life circuit-building using the NI ELVIS III, students will explore and confirm the behavior of common components and configurations.

Recommended Lab : Analog Fundamental Lab
Starting with elementary principles such as Ohm's law and Kirchoff's circuit laws, the course also covers equivalent circuits, voltage dividers and resistance bridges, capacitor and inductors circuits, and transformers.

Prerequisites

- Experience with electronics sensors & actuators

Products Used

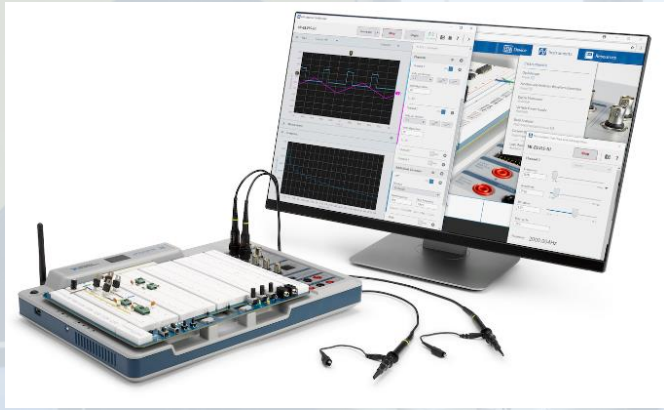
- NI ELVIS
- TI Analog Parts Kit
- Multisim Live

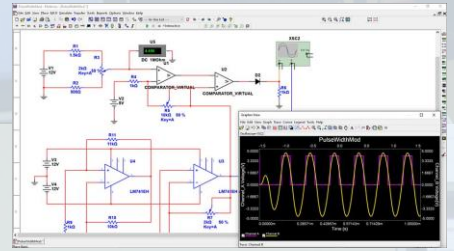
Lab Compatibility :

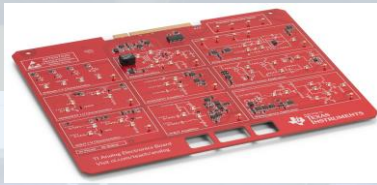
Basic Electronic Lab, Power Electronics Lab, Digital Lab, Control System Lab, Basic Instruments Lab.

Key Features :

- Versatile Platform: NI ELVIS is a multifunctional educational platform that can be used for a wide range of electronics and engineering experiments.
- Modular Design: The NI ELVIS platform supports expansion with additional modules, allowing customization for specific lab requirements.
- Connectivity: It supports USB and Wi-Fi connectivity, enabling remote monitoring and control of experiments.
- Integrated Software: It can be used with LabVIEW for programming and data acquisition, enhancing the learning experience.
- High-Quality Components: The kit includes a variety of high-quality analog components, such as op-amps, transistors, diodes, resistors, capacitors, and more.
- Simulation Software: Multisim is a powerful and user-friendly electronics simulation software that allows students to design, simulate, and analyze electronic circuits.
- Interactive Learning: It provides a visual and interactive environment for students to see how components behave in a circuit.







The NI ELVIS, the TI Analog Parts Kit, and Multisim are valuable equipment and software tools with several key features for teaching and learning electronics and electrical engineering.

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Digital Electronics Trainer Kit

Digital Electronics Trainer Kit covers both combinational and sequential digital electronics topics. Students begin by simulating logic gates in NI Multisim, and then build and deploy PLD circuits to an FPGA target.

Recommended Lab : Digital Electronics Lab
This lab series offers students a comprehensive understanding of digital electronics, combining theory, practical experiments using real hardware, FPGA programming, and simulations.

Prerequisites

- Experience with electronics sensors & actuators

Products Used

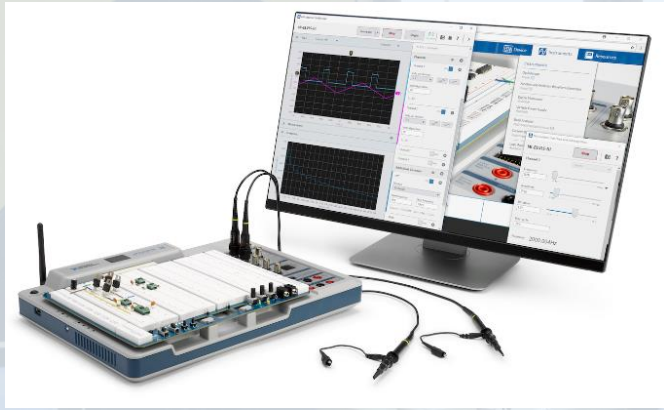
- NI ELVIS
- Digilent Digital Electronics Board
- Multisim Live
- LabVIEW FPGA Vivado

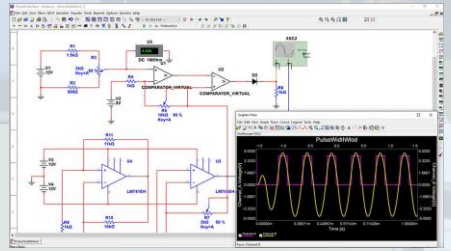
Lab Compatibility :

Microcontroller and Embedded System Lab, Digital Signal Processing Lab, Mechatronics Lab, Control System Lab.

Key Features :

- Versatile Platform: NI ELVIS is a multifunctional educational platform that can be used for a wide range of electronics and engineering experiments.
- Modular Design: The NI ELVIS platform supports expansion with additional modules, allowing customization for specific lab requirements.
- Connectivity: It supports USB and Wi-Fi connectivity, enabling remote monitoring and control of experiments.
- Integrated Software: It can be used with LabVIEW for programming and data acquisition, enhancing the learning experience.
- High-Quality Components: The kit includes a variety of high-quality analog components, such as op-amps, transistors, diodes, resistors, capacitors, and more.
- Simulation Software: Multisim is a powerful and user-friendly electronics simulation software that allows students to design, simulate, and analyze electronic circuits.
- Interactive Learning: It provides a visual and interactive environment for students to see how components behave in a circuit.





Our Digital Electronics Trainer Kit offer a combination of real-world hardware experimentation, powerful simulation capabilities, educational resources, and FPGA programming tools, creating a comprehensive learning environment for digital electronics and FPGA design.

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Power Electronics Trainer Kit

Power Electronics Trainer Kit provides guidance for a comprehensive hands-on learning experience covering the fundamentals of Power Electronics, designed for Electrical and Computer Engineering undergraduate programs. The labs form four groups: DC-DC linear regulators, DC-DC buck regulators, DC-AC inverters, and AC-DC rectifiers.

Recommended Lab : Power Electronics Lab

This Power Electronics Lab series offers students a comprehensive understanding of power electronics, combining theory, hands-on experiments with real hardware, simulation, and project-based learning.

Prerequisites

- Experience with electronics sensors & actuators

Products Used

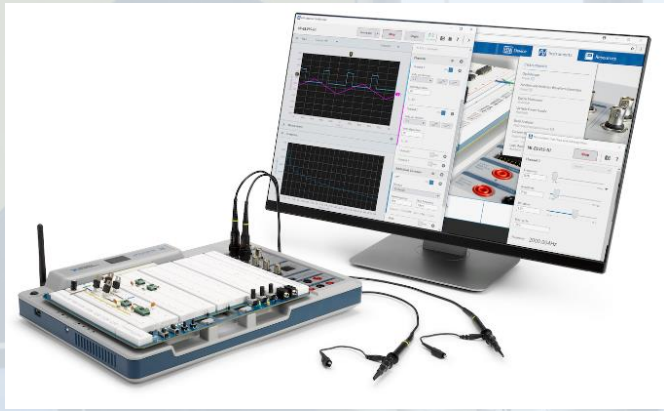
- NI ELVIS
- TI Power Electronics Board
- Multisim Live

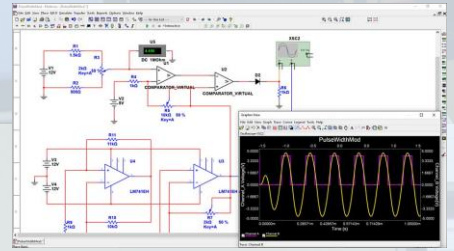
Lab Compatibility :

Energy Lab, Basic Electrical Lab, EV Lab, Analog Lab, Instrumentation and Measurements Lab.

Key Features :

- Versatile Platform: NI ELVIS is a multifunctional educational platform that can be used for a wide range of electronics and engineering experiments.
- Modular Design: The NI ELVIS platform supports expansion with additional modules, allowing customization for specific lab requirements.
- Connectivity: It supports USB and Wi-Fi connectivity, enabling remote monitoring and control of experiments.
- Integrated Software: It can be used with LabVIEW for programming and data acquisition, enhancing the learning experience.
- High-Quality Components: The kit includes a variety of high-quality analog components, such as op-amps, transistors, diodes, resistors, capacitors, and more.
- Simulation Software: Multisim is a powerful and user-friendly electronics simulation software that allows students to design, simulate, and analyze electronic circuits.
- Interactive Learning: It provides a visual and interactive environment for students to see how components behave in a circuit.





This Power Electronics Trainer Kit allows students to apply their knowledge by designing and implementing practical power electronics projects, preparing them for careers in industries related to power conversion and energy control.

About Haliatech

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haliaTECH

Control Fundamental Trainer Kit

This Control Trainer Kit with NI ELVIS & Quanser Controls Board, is your comprehensive toolkit for understanding and mastering the fascinating world of control systems. It provides a structured learning path, hands-on experiments, and the flexibility to explore advanced control topics based on your interests and goals.

Recommended Lab : Control Lab

This lab offers students a comprehensive understanding of control systems, from fundamental concepts to advanced control strategies

Prerequisites

- Experience with electronics sensors & actuators

Products Used

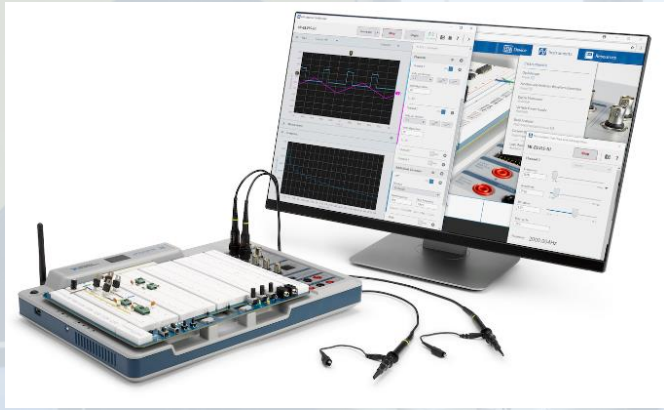
- NI ELVIS
- Quanser Control Boards
- LabVIEW

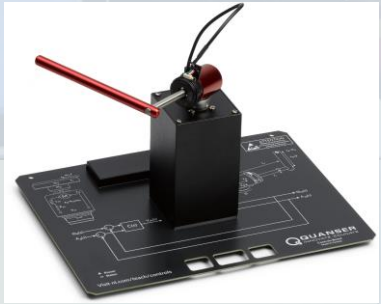
Lab Compatibility :

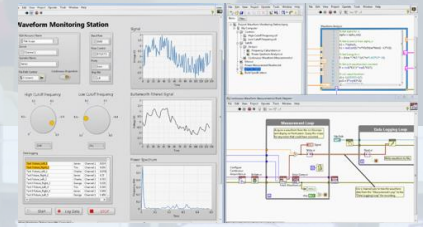
Embedded System Lab, Digital Lab, Digital Control System, Mechatronic Lab.

Key Features :

- Versatile Platform: NI ELVIS is a multifunctional educational platform that can be used for a wide range of electronics and engineering experiments.
- Modular Design: The NI ELVIS platform supports expansion with additional modules, allowing customization for specific lab requirements.
- Connectivity: It supports USB and Wi-Fi connectivity, enabling remote monitoring and control of experiments.
- Real-Time Control: The Quanser board is designed for real-time control applications, allowing students to implement and experiment with control algorithms in a responsive environment.
- Versatile Experimentation: The board is suitable for a wide range of control experiments, from basic PID control to more advanced control strategies like state feedback.
- Graphical Programming: LabVIEW employs a graphical programming approach that simplifies control system design, data acquisition, and analysis, making it accessible for students with varying levels of programming experience.







The Control Trainer Kit is your comprehensive toolkit for understanding and mastering the fascinating world of control systems. It provides a structured learning path, hands-on experiments, and the flexibility to explore advanced control topics based on your interests and goals.

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Mobile Robotic Trainer Kit

This Mobile Robotic Trainer Kit with myRIO Curriculum is more than just a learning tool, it's a gateway to a world of innovation, where students and educators alike can explore, create, and shape the future of robotics. Prepare for an educational journey that transcends boundaries and unlocks the full potential of robotics education.

Coursework Goals

1. Introduce students to the fundamental concepts of robotics
2. Familiarize students with LabVIEW programming
3. Provide students with hands-on opportunities to interface sensors and actuators related to the robotics.
4. Preparation to the advanced topics related to the robotics

Prerequisites

- Basic Knowledge of electronics sensors & actuators
- Basic knowledge of embedded system
- Experience with electronics sensors & actuators

Products Used

- myRIO
- Haliatech Mobile Robotic Kit
- LabVIEW myRIO Toolkit, LabVIEW FPGA

Coursework Topics

Introduction to LabVIEW
The first step in any LabVIEW learning path, This introduction course gives you the opportunity to explore the LabVIEW environment, dataflow programming, and common LabVIEW development techniques that related to mobile robotic learning & development.

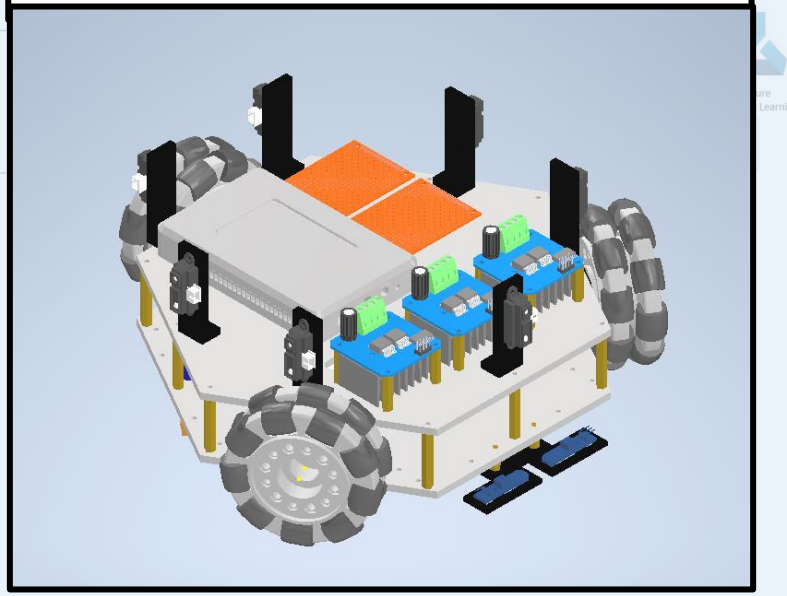
Sensors
Students learn about the fundamental role sensors play in robotics, how they gather data from the environment, and the importance of sensor data for decision-making in robots.

myRIO Basics
Learn how to physically connect sensors to the NI myRIO platform. They understand the importance of correct wiring and connection protocols.

Actuators & Control
Students explore the counterpart to sensors - actuators. They understand the role of actuators in enabling robots to interact with the environment by performing physical actions, such as moving or manipulating objects.

Robot Kinematics & Control
Understand the motion of robots without considering the forces that cause the motion. It involves studying the relationship between the positions, velocities, and accelerations of various parts of a robot's body. Kinematics is essential for planning and controlling the movement of robots in a precise and predictable manner.

Autonomous Navigation
Students are introduced to the concept of autonomous navigation, which involves robots independently navigating through their environment without direct human control.



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Predictive Maintenance Trainer Kit

This curriculum provides a structured approach to learning about predictive maintenance, rotor kits, data analysis, and fault simulation. It allows participants to gain hands-on experience in detecting and addressing rotor kit faults in a controlled environment before applying their knowledge in real-world industrial settings.

Coursework Goals

1.Understand the principles and importance of predictive maintenance in industrial settings.
2. Learn how to acquire and analyse vibration data using NI DAQ & LabVIEW
3.Apply acquired knowledge and skills to real-world predictive maintenance scenarios.
4.Learn how to build, train, and implement predictive maintenance models.

Prerequisites

- Basic Knowledge of electronics sensors & actuators
- Experience with electronics sensors & actuators

Products Used

- Haliatech Rotor Kit
- NI cDAQ & 9234
- CTC Proximity & Vibration Sensors

Coursework Topics

Introduction to Predictive Maintenance
Basics of Predictive Maintenance: This lesson provides an introduction to the fundamental concepts of predictive maintenance, emphasizing its significance in industrial settings.

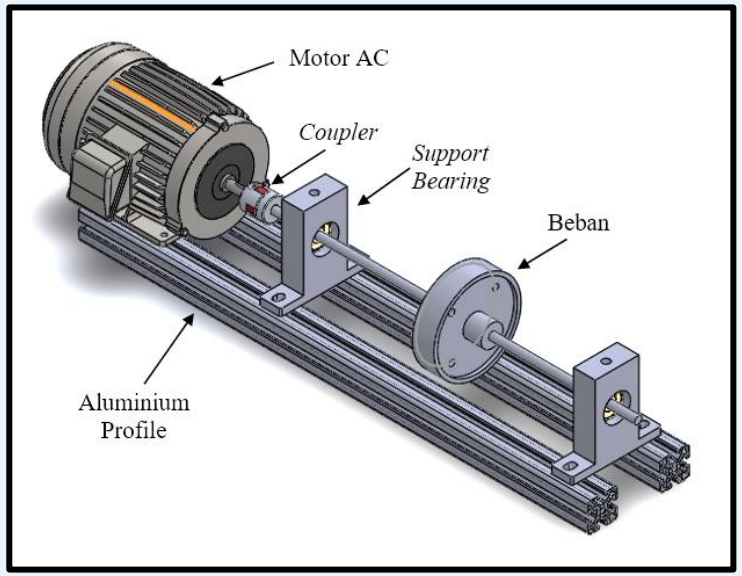
LabVIEW Fundamental
This course gives you the opportunity to explore the LabVIEW environment, dataflow programming, and common LabVIEW development techniques that related to Predictive Maintenance.

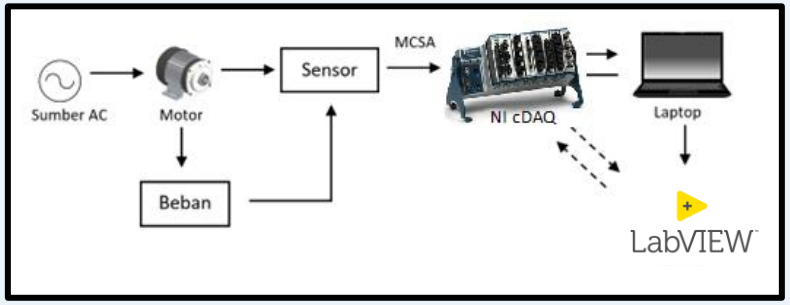
Data Collection and Analysis
Practical techniques for collecting data from rotor kits are explained in this lesson. Topics include sensor placement and data acquisition. Participants learn the basics of data analysis tools and software, including how to identify normal operating parameters.

Fault Detection
Introduces common rotor kit faults such as unbalance, misalignment, bearing defects, and more. It covers how these faults manifest in collected data.

Predictive Maintenance Models
Learn how to implement predictive maintenance models in real-world scenarios. They also gain insights into monitoring and updating models for accuracy.

Predictive Maintenance Simulation
This lesson guides participants in applying predictive maintenance techniques to the simulated rotor kit faults. It includes case studies and practical examples.





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