

SENSE CONSULTANCY SERVICES (SCS)

Electronically Efficiently Economically



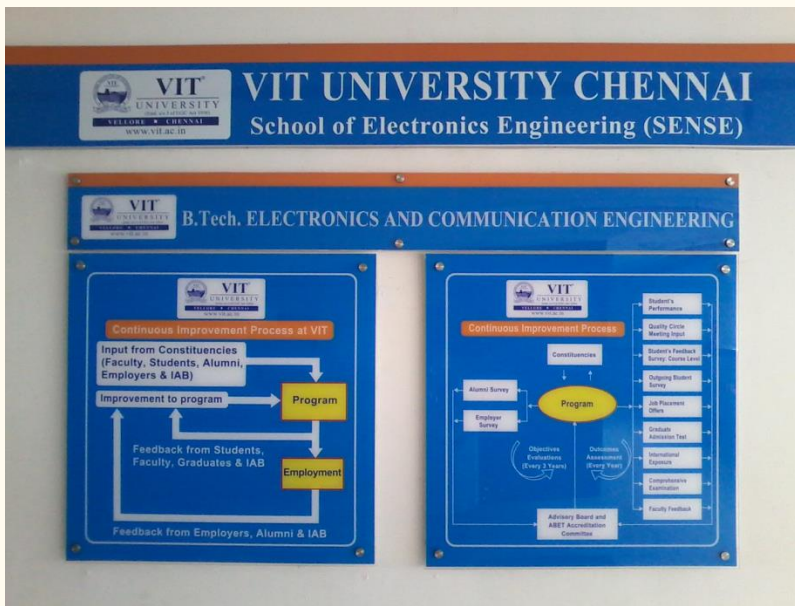
VELLORE INSTITUTE OF TECHNOLOGY, CHENNAI

*Vandalur –Kelambakkam Road
Chennai - 600127*



Vellore Institute of Technology (VIT) has made a mark in the field of higher education in India by providing quality education on par with international standards, through its 35 years of existence in a cross-cultural ambience with extensive application oriented research. VIT Chennai is a globally engaged, competitive, comprehensive and research-enriched university campus strategically positioned in the capital city of Tamil Nadu, to respond to major industrial, social, economic and environmental demands and challenges.

The School of Electronics Engineering (SENSE) at VIT Chennai was established for imparting the state-of-the-art education, training and research in the field of Electronics and Communication Engineering and allied areas. The School offers Bachelor's level program in Electronics and Communication Engineering and Electronics and Computer Engineering, Master's programs in VLSI Design, and Embedded Systems, M.Tech (By research) and PhD in all the areas of Electronics and Communication Engineering and allied fields.





SENSE Consultancy Services (SCS) is a problem solving and solution providing scheme that can enable your organisation to partner with the School of Electronics Engineering at VIT Chennai for your needs by undertaking projects and services.

Focus Areas

- ❖ **EMC & RF Test**
- ❖ **VLSI Design**
- ❖ **Embedded System Design**
- ❖ **MEMS & Microwave Engineering**
- ❖ **Electronic Hardware System Design**
- ❖ **Digital Signal Processing**
- ❖ **Wireless Communication & Networking**
- ❖ **Fibre Optics & Photonics**

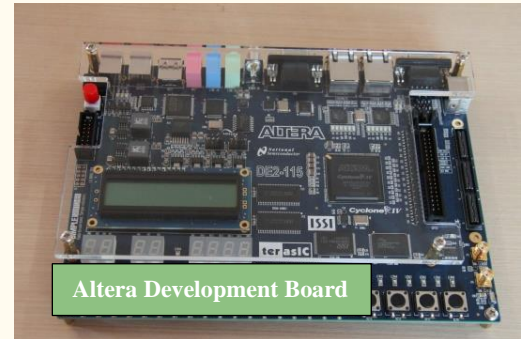
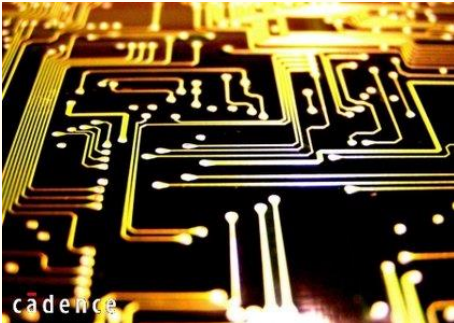
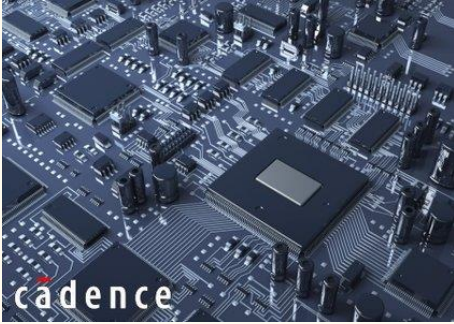
How SCS can benefit your organisation?

- ❖ **Efficient & Economic Solution to Your Problems**
- ❖ **Inputs from Expert Professors**
- ❖ **Rapid Implementation Services**
- ❖ **Results Driven Delivery of Agreed Outputs**
- ❖ **Interaction & Access to University Resources**
- ❖ **Corporate Training & Workshop**
- ❖ **Student Internships**
- ❖ **Value Added Certificate Programs**

VLSI DESIGN

Key Offerings

- ❖ Specifications to GDSII
- ❖ Architecture Design
- ❖ IP Development
- ❖ Functional Verification
- ❖ FPGA Based Prototyping
- ❖ Physical Design
- ❖ Design for Testability
- ❖ Test Bench Development
- ❖ Functional & Structural Testing
- ❖ Post Silicon Validation



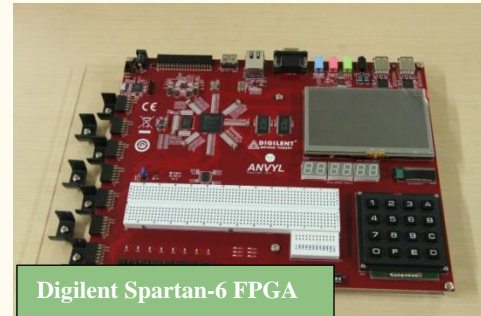
Embedded Systems Design

Key Offerings

- ❖ RTOS Configuration and validation
- ❖ IoT End to End Stack Development
- ❖ CAN Protocol Analysis
- ❖ 6LoWPAN deployment
- ❖ Product Modeling & Code Generation
- ❖ Schematic Capture & Board Design
- ❖ Industrial Control and Automation
- ❖ In-Vehicle Infotainment Systems
- ❖ Patient Monitoring Systems
- ❖ Home Automation
- ❖ LabVIEW based Embedded Systems
- ❖ Design & Development of ATE



TI Tiva LaunchPad



Digilent Spartan-6 FPGA



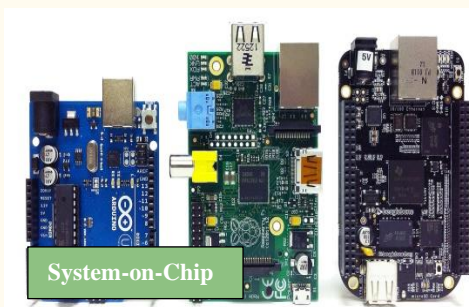
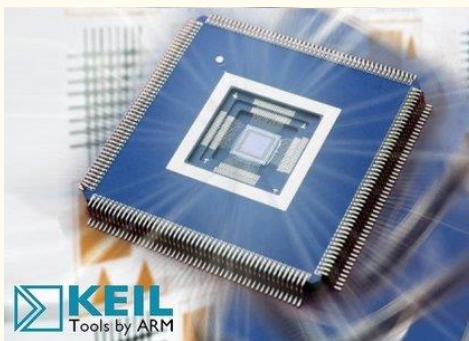
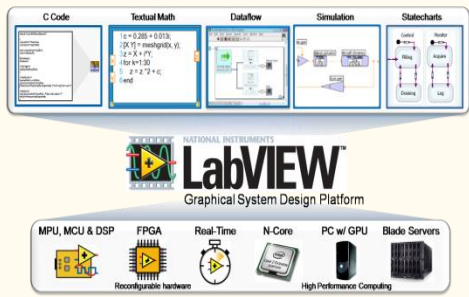
NI cRIO with I/O Modules



TI DSP Development Board

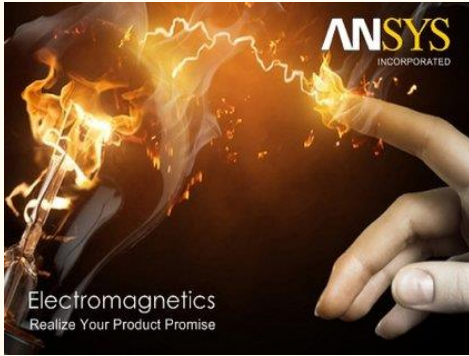
Facilities

- ❖ ARM9, ARM7, ARM Cortex M0 & M4
- ❖ Arduino/STM32/Nuvoton Kits
- ❖ Beagle Bone, Raspberry Pi
- ❖ APPCOE - Cross OS Development
- ❖ Mbed NXP LPC11U24
- ❖ XUPV5 board Xilinx Virtex 5
- ❖ Xilinx Zynq Board
- ❖ Digilent Basys 3 (SoC)
- ❖ IAR/Keil/GCC IDE
- ❖ NI LabVIEW FPGA/RT
- ❖ NI cRIO Systems
- ❖ NI DAQ & I/O Modules
- ❖ Xilinx ISE/Vivado
- ❖ TI TIVA TM4C123G
- ❖ Freescale FRDM - KL25Z
- ❖ GSM/GPS/XBEE/Wi-Fi/NFC/Bluetooth



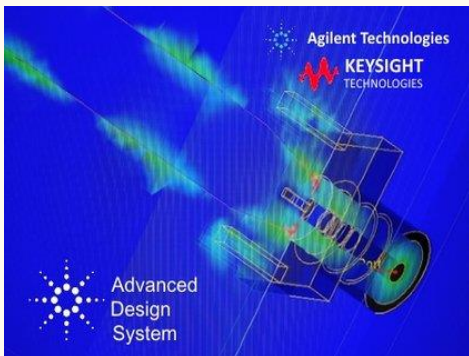
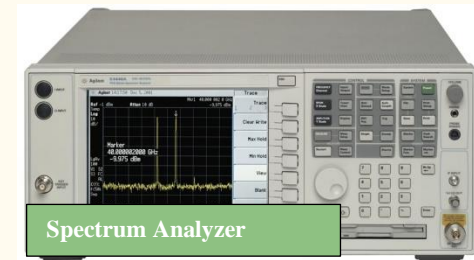
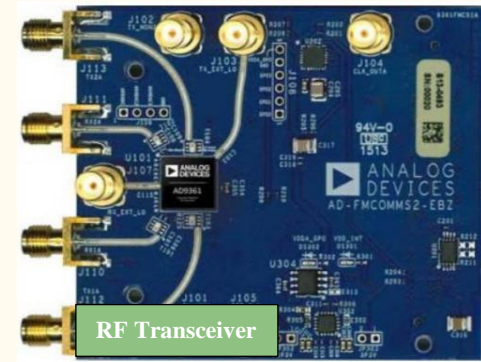
System-on-Chip

MEMS & Microwave Engineering



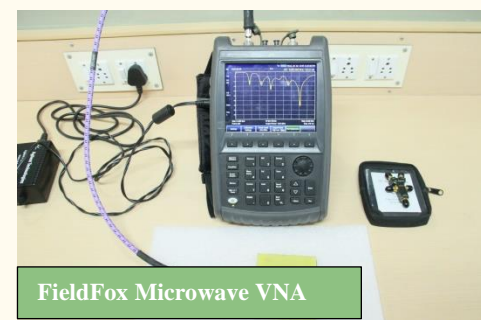
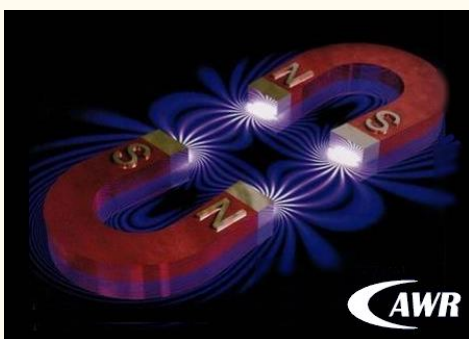
Key Offerings

- ❖ Quartz and Pyrex Micromachining
- ❖ Silicon Bulk Micromachining
- ❖ Design of Ultra Miniature Sensors
- ❖ Design of Gas Sensors
- ❖ Design of Nanocantilevers
- ❖ RF Transceiver Design
- ❖ Low Noise Wideband Amplifier Design
- ❖ Microstrip Circuit Design
- ❖ Design of Antennas for LF & HF
- ❖ Design of RF and Microwave amplifiers
- ❖ Design & Testing of Oscillators
- ❖ Design of RF MEMS Devices



Facilities

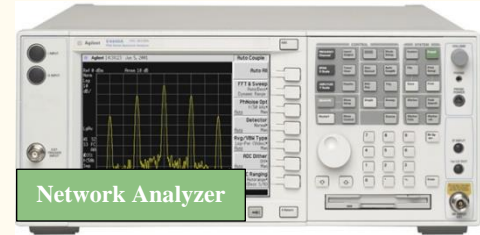
- ❖ Vector Network Analyser
- ❖ TMI Klystron Bench – X band
- ❖ TMI Gunn Microwave Bench
- ❖ MMIC Trainers – X band
- ❖ MMIC Antenna – S band
- ❖ Spectrum Analyzer
- ❖ Analog Devices-FMC-COMMS2-EBZ
- ❖ Ansoft HFSS
- ❖ Agilent Advanced Design System
- ❖ AWR Microwave Office
- ❖ Pulsed Power Supply
- ❖ Electro Chemical Discharge Machine
- ❖ XYZ Motion System for ECDM
- ❖ Digital Analytical Balance
- ❖ COSLAB Metallurgical Microscope
- ❖ IntelliSuite



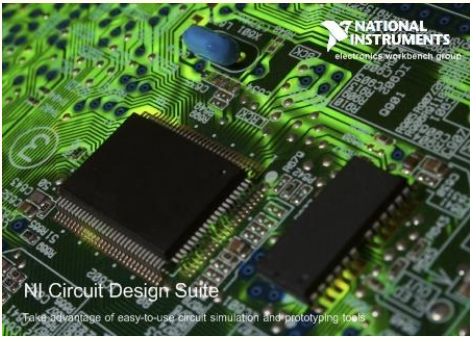
Electronic Hardware Systems Design



Vector Signal Analyzer



Network Analyzer



NI Circuit Design Suite



OrCAD 16.6



Logic Analyzer



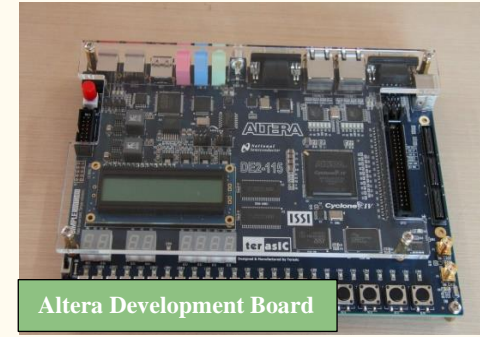
KINECT MSXB1045

Key Offerings

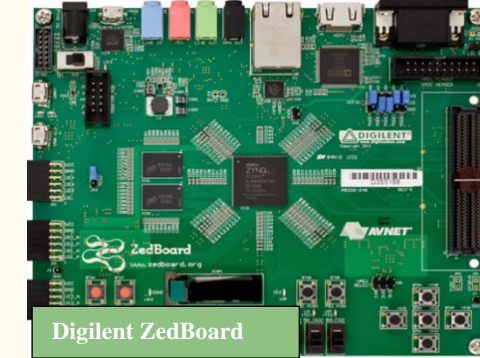
- ❖ Analog & Digital System Design
- ❖ Prototype Product Development
- ❖ Schematic Capture & PCB Design
- ❖ High Speed Board Design
- ❖ Fabrication Of Super Capacitors
- ❖ Fabrication Of Lithium-Ion Batteries
- ❖ Battery Performance Testing
- ❖ Code Generation & Verification
- ❖ Functional & Performance Testing
- ❖ White & Black Box Testing
- ❖ Design & Development of ATE
- ❖ Electrical Characterization
- ❖ Board Level Integration Testing
- ❖ Regression & Reliability Assessment

Facilities

- ❖ Xilinx Spartan 3E FPGA Kits
- ❖ Altera DE2 115 Developer Boards
- ❖ Logic Analyzer
- ❖ Spectrum analyzer
- ❖ Digital Storage Oscilloscope
- ❖ TMI Analog and digital IC testers
- ❖ Cadence OrCAD PCB suite
- ❖ NI Multisim
- ❖ Kinect MSXB1045 Xbox 360
- ❖ Software Defined Radio Kit
- ❖ Digilent ZedBoard
- ❖ Analog Devices-FMC-COMMS-EBZ
- ❖ Vector Signal Analyzer



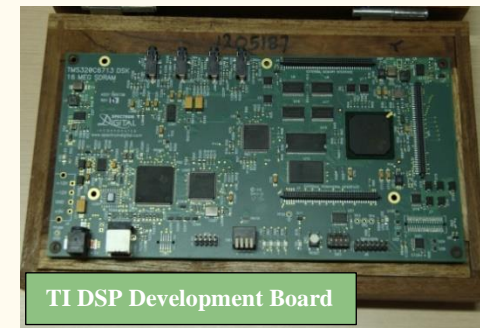
Altera Development Board



Digilent ZedBoard



Xilinx Virtex-5

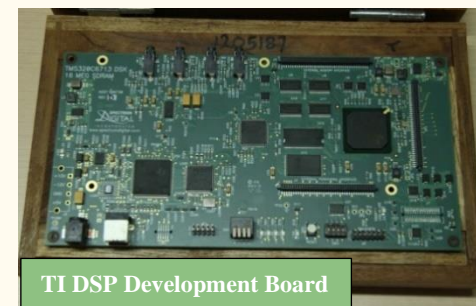


TI DSP Development Board

Digital Signal Processing

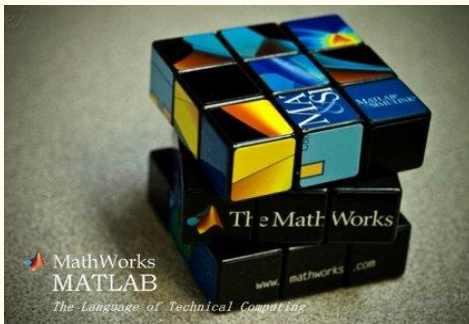
Key Offerings

- ❖ Acoustic Simulations & Modeling
- ❖ Algorithm Development
- ❖ Digital Filter Design
- ❖ Real-time Implementation
- ❖ System Optimization
- ❖ Audio/Speech Coding and Processing
- ❖ Digital Control Systems
- ❖ Spatialization and System Identification
- ❖ Voice Architecture Framework using Nuance tool
- ❖ Speech Recognition Product Prototyping
- ❖ Testing Scripts for ASR Systems
- ❖ Active Noise and Vibration Control
- ❖ Biomedical System Design
- ❖ Medical Image Processing



Facilities

- ❖ TI C6713 DSP Boards
- ❖ Xilinx Virtex 5 SXT Boards
- ❖ TI DM355 DaVinci
- ❖ ARM TMDSSK 3358 Sitara
- ❖ AM335X ESA MCB-51
- ❖ ARM 9 STR912
- ❖ Logic Analyzer
- ❖ TI MSP430 Kits
- ❖ AM3359 ICE Kits
- ❖ NI DAQ Cards
- ❖ MATLAB



Wireless Communication & Networking

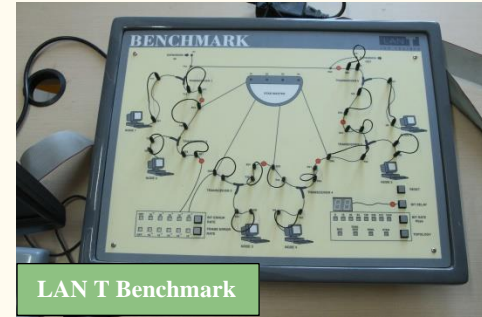


Key Offerings

- ❖ Cloud based Processes & Applications
- ❖ Wireless Ad-hoc & Sensor Networks
- ❖ Performance Evaluation & Simulation

Facilities

- ❖ Benchmark LAN-T
- ❖ Benchmark NETSYS-T WLAN-T
- ❖ NetSim – Network Simulator & Emulator
- ❖ Network Simulator NS2 NS3
- ❖ MATLAB & Simulink



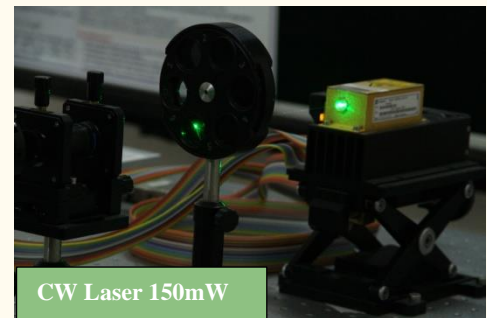
LAN T Benchmark



Fibre Optics & Photonics

Key Offerings

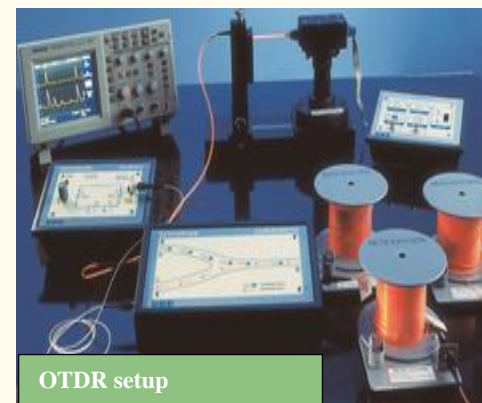
- ❖ Optical and Digital Interferometry
- ❖ Microstructure Testing
- ❖ Holography and Digital Holography
- ❖ Microscopic & Phase Contrast Imaging



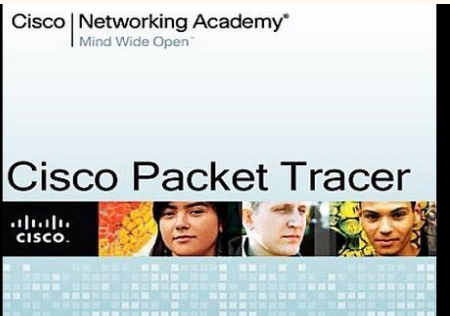
CW Laser 150mW

Facilities

- ❖ Vibration Isolation Platform
- ❖ CW Green Laser
- ❖ CMOS Sensor
- ❖ Laser Beam Collimation Tester
- ❖ Optic Wave Design Software
- ❖ Laser and Detection Module
- ❖ DWDM & EDFA Modules
- ❖ OTDR setup
- ❖ Lumerical – Photonics Simulation



OTDR setup



Optical Setup for Digital Holography

Anechoic Chamber Facility for Characterization of Antenna Parameters

Make:

- Anechoic Chamber (range – 700 MHz to 18 GHz) configured by Conet Technologies Private Limited

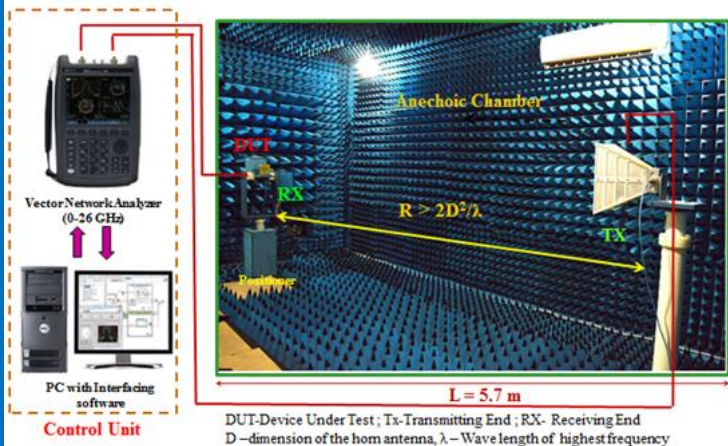
Specification /Features:

- Frequency Range: 700 MHz – 18 GHz
- Chamber Size: 7 x 3.5 x 3m
- **Shielding Effectiveness:** -110 dB in 700MHz to 15 GHz dB and -90 dB in 15GHz-18 GHz
- **Transmitting Antenna :**
Pyramidal Horn (600 MHz to 18 GHz)
- Gain: 15 dB
- 3-Axis Automatic Positioning System
- **Absorbent performance:**
- Reflected Power from Absorber: -40 dB
5 Watt/in² or 775 Watt/m² Power Handling Tested as per IEEE Standards
Fire Retardant as per NRL 8093
- Quiet Zone: 1m

Capabilities:

Measurement of the following parameters:

- Voltage Standing Wave Ratio
- Return Loss
- Impedance
- Gain
- Axial Ratio
- Cross Polarization
- 2D E/H Radiation Pattern
- Material properties measurement (complex μ and ϵ) in X band
- Frequency Selective Surface properties



Applications and Measurements:

- Antenna – radiation pattern measurement
- Transmission and reflection parameters of microwave components
- Frequency Selective Surface

Location:

Room No.: AB2 - 003
Academic Block II
School of Electronics Engineering
VIT Chennai

Optical Microscope

Make: OLYMPUS

Model: Olympus BX53M

Specification /Features:

Optical microscope in reflection mode for metallurgical samples



Capabilities

- Morphology Analysis of powders and film samples
- Measurement of dimensions in the range of 400 nm to few microns
- Metallurgical Optical Microscope with 5X, 20X, 50X and 100X magnification
- Opaque Material samples with thickness less than 3-4 mm

Applications:

Useful for multiple disciplines of research such as material science, physics, chemistry metallurgy, nanotechnology and nano-science

Location:

Room No.: 601A

Academic Block II

School of Electronics Engineering

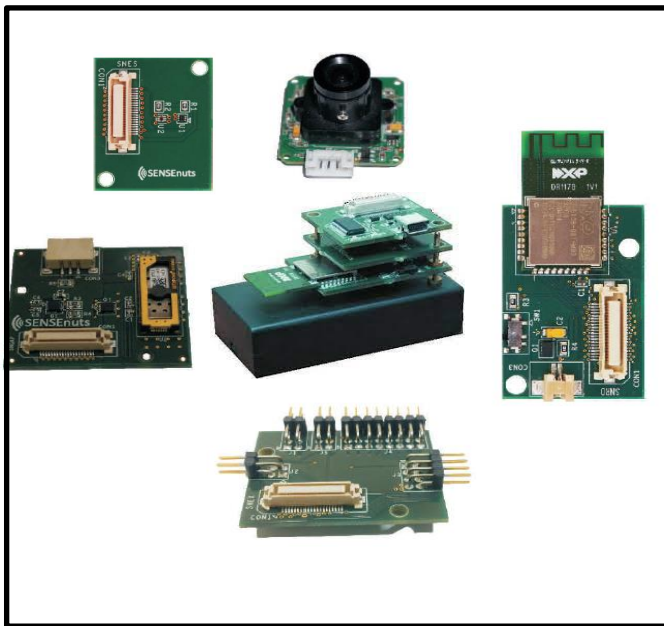
VIT Chennai

Make: Product of EIGEN Technologies Pvt. Ltd.

Model: Centre of Excellence for IoT

Specification /Features:

- Radio Module
- TL Sensor Module
- USB Gateway Module
- HTP Sensor Module
- GAP Sensor Module
- Camera Module
- WiFi Gateway Module
- Ethernet Gateway Module
- 2G/3G Gateway Module
- Extender



Capabilities:

- 32-bit RISC JN 5168 Microcontroller
- 1-32MHz clock speed
- 256KB flash, 32KB RAM, 4KB EEPROM
- 2.4 GHz IEEE 802.15.4 compliant transceiver
- 128-bit AES security processor
- Integrated PCB antenna
- Rx current 17mA, Tx current 15mA
- 2V to 3.6V battery operation
- Controllable transmission power (-32 to +2.5 dBm)
- Data Transfer rate 115200 baud
- 128 byte receive buffer and 256 byte transmit buffer
- Self-healing multi-hop network
- C based programming
- Flexible MAC protocol implementation
- Live data Interface with MATLAB

Applications:

Environment monitoring, Security implementation, Home automation, Industrial control, Precision Agriculture, Predictive maintenance, IoT applications

Location:

Room No.: 501 A
ACADEMIC BLOCK II
School of Electronics Engineering
VIT Chennai

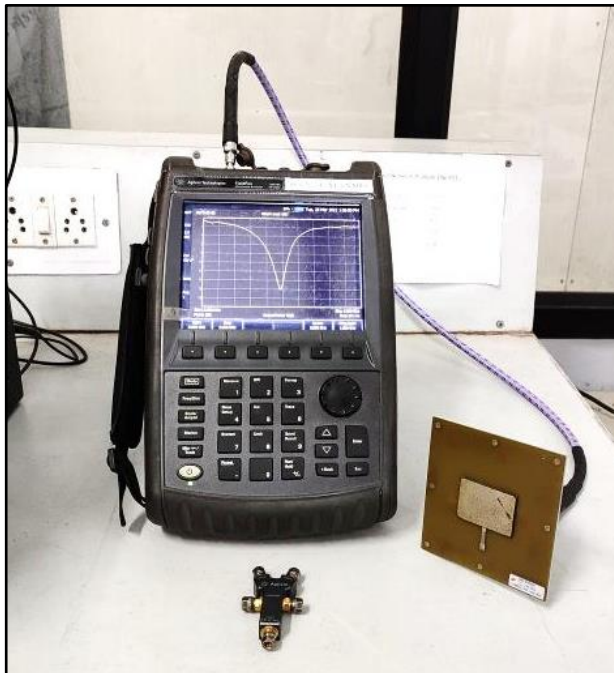
Vector Network Analyzer for Characterization of Microwave Components

Make:

- Vector Network Analyzer N9918A (range – 30 kHz to 26 GHz) by Agilent Technologies

Specification /Features:

- Frequency Range: 30 kHz – 26 GHz
- Industry's lightest all-in-one portable VNA at only 3.0 kg



Capabilities:

Measurement of the following parameters:

- cable and antenna analyzer
- Voltage Standing Wave Ratio
- Return Loss
- Impedance
- Measure all four S-parameters simultaneously
- Calibrate easily with QuickCal

Applications:

- Microwave component – S parameters measurements
- Voltage Standing Wave Ratio, Return loss, impedance measurements
- Material properties measurement (complex μ and ϵ) in X band

Location:

Room No.: AB2 - 003
Academic Block II
School of Electronics Engineering
VIT Chennai

34-Channel Portable Logic Analyzer

Make: Agilent

Model: 16801A 34-Channel Portable Logic Analyzer

Specification /Features:

34-channel portable logic analyzer

Comprehensive single-ended signal support

Compatible with 40-pin logic analyzer probes

Selectable memory depths: 1M, 4M, 16M, 32M

Maximum state clock rate 250 MHz with option 250

Maximum state data rate 250 Mb/s with option 250

Maximum timing sample rate 1.0 GHz/500 MHz



Capabilities:

- A portable logic analyzer offering the performance, applications, and usable digital development team needing quick debugging, validation, and optimization of digital system
- 250 ps resolution (4 GHz) timing zoom to find elusive timing problems quickly, without double probing
- 15" display, with available touch screen, allowing to see more data and navigate quickly
- View Scope allowing time-correlated measurements and displaying of logic analyzer and oscilloscope data letting the effective track down problems in the design
- Automated threshold/sample position setup ensures accurate measurements on high-speed buses

Applications:

Application support for every aspect of today's complex designs—FPGA dynamic probe, digital VSA (vector signal analysis) and broad processor and bus support

Location:

Room No.: 512

Academic Block-II

Microcontroller and Its Application Lab

School of Electronics Engineering

VIT Chennai

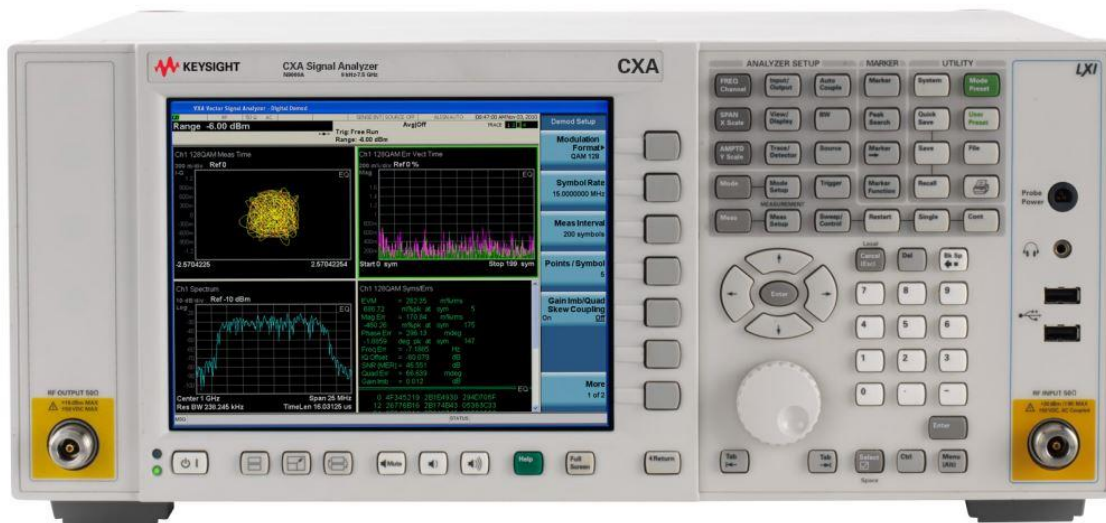
CXA X-Series Signal Analyzer N9000A

Make: Agilent

Model: N9000A-503. Frequency range, 9 kHz to 3.0 GHz

Specification /Features:

- Testing of RF and microwave components
- Spectrum analysis and Power measurements



Capabilities:

- Ideal for manual or automated testing of RF and microwave components such as amplifiers and filters, as well as electronic products such as cordless phones, wireless LAN routers, and wire-less paging systems
- Measurement capabilities include general-purpose spectrum analysis and one-button PowerSuite measurements.

Applications:

Useful for essential signal characterization

Provide a foundation for cost-effective testing and seamless integration with the other X-Series models

Location:

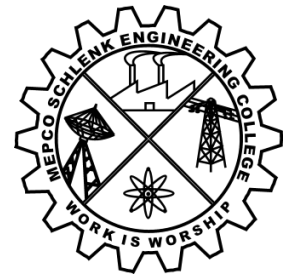
Room No.: 505

Academic Block-II

School of Electronics Engineering

VIT Chennai

Major Customers



CONTACT

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