



**VIT**<sup>®</sup>

**Vellore Institute of Technology**  
(Deemed to be University under section 3 of UGC Act, 1956)

**SCHOOL OF ELECTRICAL ENGINEERING**  
**(SELECT)**  
**RESEARCH & CONSULTANCY BROCHURE**

**Contact:**

**DEAN**

SCHOOL OF ELECTRICAL ENGINEERING

VIT Chennai, Tamil Nadu-600127

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Phone: 7358782578

# About School of Electrical Engineering

## Faculty of Electrical Engineering

The SELECT School has highly qualified faculty with a wide range of research specialisations such as Power systems and control engineering, Electric Vehicles, Power converters for Renewable power generation systems, Controllers for grid integration, Special machines and drives for Industrial applications, Micro grid, Internet of Things, Robotics, Wireless power transfer system, Industrial Automation and deregulated power system. The faculty have brought laurels to the School through awards and recognitions for their innovations.

## Laboratory and Research Facility

The SELECT School has 12 labs with modern infrastructure. The facilities are available in labs like Smart grid lab, Protection and switch gear lab, PCB fabrication and testing lab, Advanced Electrical drives lab. It has well equipped laboratories and some of the specialised equipment and software packages are - Power Quality Analyser, MDO, MSO, DSO, MLI converters, Programmable DC power supply, 3 Phase TO 9 Phase Matrix Converter, MATLAB, PSCAD, DSPICE, MAGNET, ThermNET, Numerical Relay, Transmission Line Simulator, ARM, DSP and FPGA processors, PLC controller, Magnetic Levitation system, Tank set up process control simulator, Hybrid Grid integrated system, Opal RT simulator, Quanser Cube Control Equipment.

## Program Offered: B.Tech - Electrical and Electronics Engineering



# Real Time Digital Simulator: OP4500 eminisim unit

**Make:** OPAL-RT

**Model:** OP4500

## Specification /Features:

- Real Time Simulator
- Rapid Control Prototype
- Hardware in Loop



## Capabilities:

- MATLAB-SIMULINK interface
- Control Signal (including PWM) generation and hardware interface
- Sensors interface
- Real Time simulation

## Applications:

Useful for multiple disciplines of research such as

- Power system
- Power electronics
- Electric drives
- Control & instrumentation, etc.

## Location:

Room No.: 707C  
Academic Block 1  
School of Electrical Engineering  
Vellore Institute of Technology (VIT)  
Chennai

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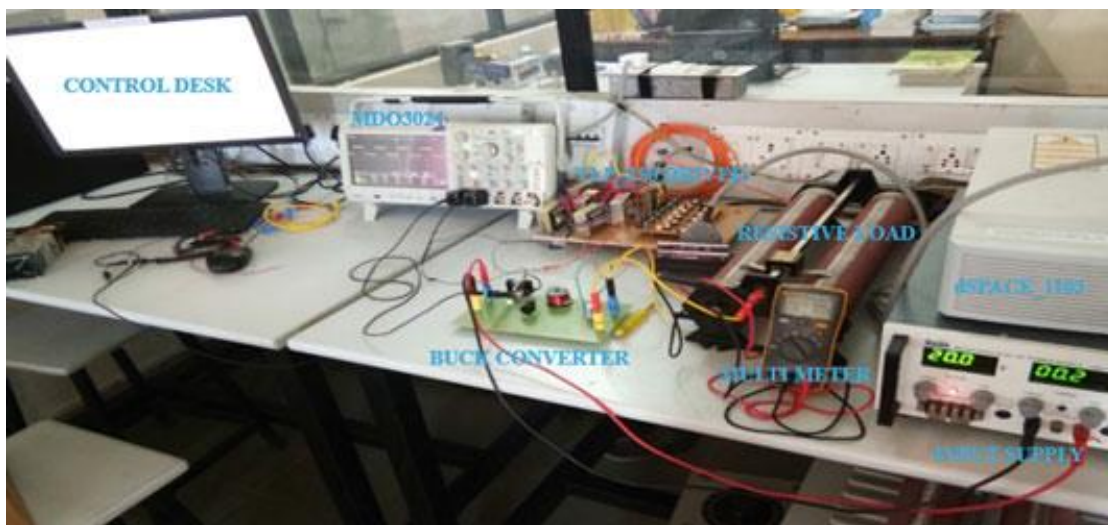
# DSPACE1103 CONTROLLER

**Make: dSPACE**

**Model: DS1103**

## Specification /Features:

- RTI Library Tools
- Analog and Digital I/O Ports
- PWM Blocks
- PPC Controller Board



## Capability:

- MATLAB Simulink Interface
- Sensors Interface
- Control Signal Generation
- PWM Control

## Applications:

- Electric Powered Automobiles
- Mechatronics Systems
- Power Electronics Converters and Inverters
- Electrical Drives
- Design of Controllers for Power Electronics Converters and Drives

## Location:

Room No.: 016  
Academic Block 2  
School of Electrical Engineering  
VIT Chennai

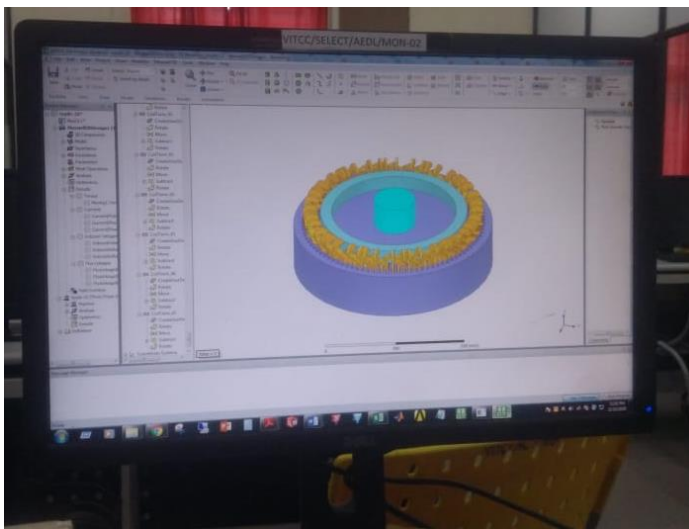
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# ANSYS, MAGNET, MAXWELL AND MOTOR SOLVE SOFTWARE TOOLS

## Specification /Features:

- Slot Templates
- Finite Element Method
- Thermal Analysis Tools
- 2-D and 3 –D Modeling
- Graphical Analysis



## Capability:

- Electrical Machine Design
- Thermal Analysis
- 2-D and 3-D Analysis
- Electric and Magnetic Field Analysis
- Noise and Vibration Analysis
- Finite Element Analysis

## Applications:

- Design of DC Machines
- Design of Induction Machines
- Design of Special Electrical Machines
- Design of Transformers
- Design of Actuators
- Design of Energy Efficient Motors

## Location:

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# USB TORQUE SENSOR

**Make: Lorenz Messtechnik**

**Model: DR 3000/M420**

## Specification /Features:

- USB type with software facility
- Torque Capacity - 0-200 Nm
- Speed Range - 15000 rpm
- Communication and Evaluation Software DR-USB-VS



## Capability:

- Determination of the torque of all types of electrical machines
- Performance calculation via software
- Simple handling and assembly
- Integrated speed and angle measurement

## Applications:

- Research and Development
- Process measuring and control technology
- Measuring and control devices
- Tool engineering and special mechanical engineering

## Location:

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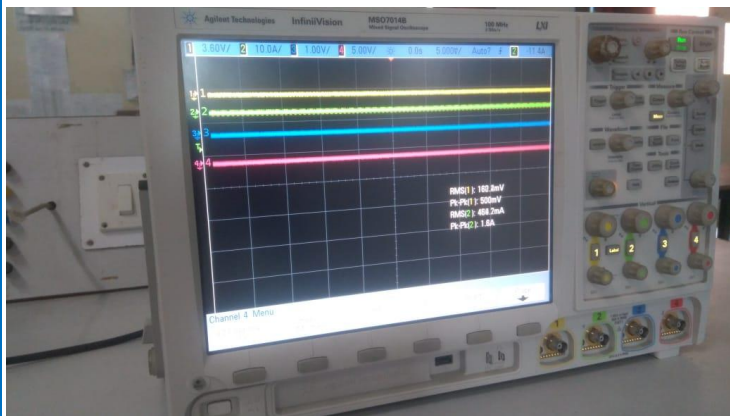
# Agilent MSO 7014B 100 MHz with 7 kV High Voltage Differential Probe

**Make:** Agilent

**Model:** MSO 7014B-LXI Compliant 100 Mhz 4+ 16Ch 2GS/S 8 MB Memory

## Specification /Features:

- 100 MHz with 7 kV High Voltage Differential Probe



## Capabilities:

- 100 MHz
- 4 analog channels
- View signals easily on the large 12.1-inch XGA display
- See signals more accurately with a 2 GSa/s sample rate
- Capture long signals easily while maintaining a high sample rate with 8 Mpts memory
- Find intermittent problems quickly with 100,000 wfms/s update rate
- View and debug FPGAs faster with tailored software
- Enhance testing with segmented memory, serial analysis, and mask testing
- Debug quickly with automatic search

## Applications:

Measurement of parameters in

- Power systems
- Power Electronic Systems
- Other Electronic Systems in institutions and industries (Power quality measurement)

## Location:

Power Electronics Hardware Lab  
Academic Block 1  
School of Electrical Engineering

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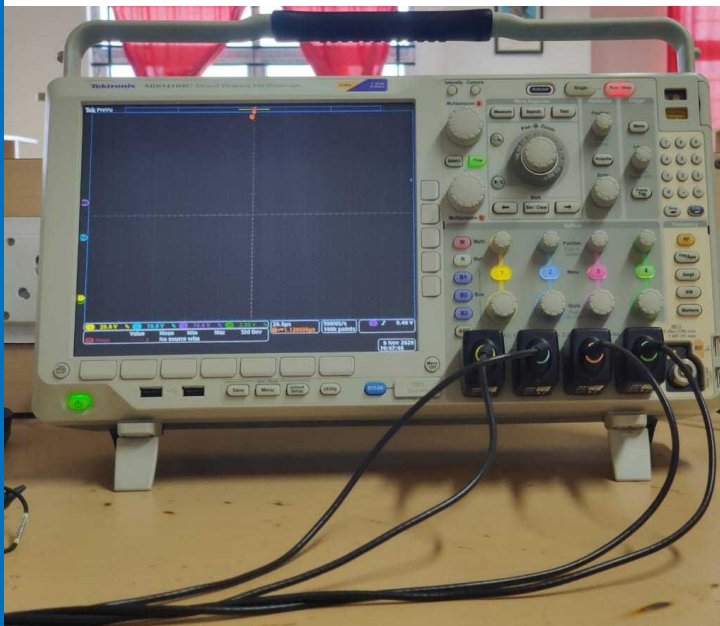
# Tektronic MDO

**Make:** Tektronix

**Model:** MDO4104C-Mixed Domain Oscilloscope

## Specification /Features:

- 4-channel, 1 GHz analog
- 20 M record, Spectrum analyser
- 9 kHz to 6 GHz Application Module



## Capabilities:

- 4 analog channels
- 1 GHz bandwidth 350 ps rise time 5 GS/s sample rate
- 20 M record length on all channels
- > 340,000 wfm/s maximum waveform capture rate
- Standard passive voltage probes with 3.9 pF capacitive loading and 1 GHz or 500 MHz analog bandwidth

## Applications:

Measurements in

- Power systems
- Power Electronic Systems
- Other Electronic Systems in institutions and industries

## Location:

Power Electronics Hardware Lab  
Academic Block 1  
School of Electrical Engineering

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# Programmable Power supply

**Make:** Magna Power

**Model:** SL100-26/440

## Specification /Features:

- 100 V, 20 A



## Applications:

- Testing of Power Electronic Systems and other Electronic Systems in institutions and industries

## Location:

Power Electronics Hardware Lab  
Academic Block 1  
School of Electrical Engineering

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# Ball and Beam System

**Make:** Quanser

**Model:** SRV02

## Specification /Features:

- Dimensions (L x W x H) - 15 x 15 x 18 cm
- Weight - 1.2 kg
- Nominal voltage - 6 V
- Motor maximum continuous current (recommended) - 1 A
- Encoder resolution (in quadrature) - 4096 counts/rev
- Gear configuration - 70:1 (high-gear) 14:1 (low-gear)



## Capabilities:

- Turn-key servomotor system for modern, expandable control lab
- Ideally suited to introduce basic control concepts and theories on an easy-to-use and intuitive platform
- Optional Master and Slave Configuration
- Modeling Identification and Validation
- Multiple loops
- Cascade controller design
- LQR Control

## Applications:

Real-world applications of

- rotary servomotor include the autofocus feature in modern cameras
- cruise control in automobiles, and speed control in CD players

## Location:

Room No.: Academic Block I - 306  
Control & Instrumentation Lab  
School of Electrical Engineering

## Contact:

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# Magnetic Levitation System

**Make:** Feedback Equipment

**Model:** 33-026

## Specification /Features:

- Non-linear, unstable process
- Analogue and Digital control
- Optical sensing with 20mm set-point range
- Closed-loop identification
- Fully assembled plant with integral power supplies
- Lightweight 25mm suspended body
- Open architecture, design-oriented system



## Capabilities:

- Magnetic Levitation model
- Maglev model identification
- Maglev model identification
- Maglev setup control
- Plant control
- PID controller
- PD control of ball position
- Real time PD control of ball position
- Real time PID control of ball position
- WMV ball position model control
- WMV ball position Real Time control
- Stand-alone controller tracking
- External set point

## Applications:

- Visually appealing system with convenient time constants for both analogue and digital control solutions
- Suitable for design and project-oriented studies

## Location:

Room No.: Academic Block I - 306  
Control & Instrumentation Lab  
School of Electrical Engineering (SELECT)

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## 8.5 Digit Reference Multimeter

**Make:** Fluke

**Model:** 8508A

### Specification /Features:

Voltage DC – Range: 0 to  $\pm 1050$  V  $\pm 3$  ppm of reading

Voltage AC - 2 mV to 1050 V, 1 Hz to 1 MHz  $\pm 65$  ppm of reading

Current DC - 0 to  $\pm 20$  A  $\pm 12$  ppm of reading

Current AC - 2  $\mu$ A to 20 A, 1 Hz to 100 kHz  $\pm 250$  ppm of reading

Resistance - 0 to 20 G $\Omega$   $\pm 7.5$  ppm of reading

Temperature - -200  $^{\circ}$ C to 660  $^{\circ}$ C  $\pm 2.5$  m  $^{\circ}$ C\*

\*Typical equivalent measurement uncertainty for 100  $\Omega$  PRT/SPRT probe at 0  $^{\circ}$ C



### Applications:

- Standard high-end digital Multimeter
- High-precision and fast digitizing for calibration labs or fast throughput in test environments

### Location:

Room No.: Academic Block I - 306  
Control & Instrumentation Lab  
School of Electrical Engineering

### Capabilities:

- Designed specifically with superior accuracy and stability over a wide range of measurements
- Designed to serve as a versatile precision measurement tool for calibration laboratories that must meet increasingly stringent measurement uncertainty analysis requirements demanded by ISO 17025, as well as the need for increased productivity
- 8508A features 8.5 digit resolution, exceptional linearity and extraordinarily low noise and stability, producing what is arguably the most accurate measurements

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# Multi-Function Calibrator

**Make:** Transmille

**Model:** 3041A

## Specification /Features:

- 0 - 1000V DC / AC Voltage
- 0 - 30A DC / AC Current
- 0 - 1 GOhm Resistance
- 1nF - 10mF Capacitance
- 1Hz - 10MHz Frequency
- Range of external accessories to increase workload



## Capabilities:

- Precision, multiproduct calibrator with up to 8 ppm accuracy
- Widest workload coverage of any multi-product calibrator, with the ability to calibrate 18 types of instrument
- Calibrates: Multimeters, oscilloscopes, clamp meters, watt & power meters, RLC meters, AC bridges, power supplies, high resistance and data loggers
- Power to drive older analogue instruments alongside the accuracy to calibrate modern digital instruments
- UKAS calibration traceable to National standards

## Applications:

- Wide range of calibration work quickly, accurately and economically
- External calibration adapters, power supplies, process control calibrators, electrometers, insulation testers, pressure gauges and transmitters
- Quick and efficient torque calibration

## Location:

Room No.: Academic Block I - 306  
Control & Instrumentation Lab  
School of Electrical Engineering

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# PCB Milling Machine

**Make:** MITS Japan

**Model:** AUTOLAB, 14ATLB285

## Specification /Features:

- Time saving of product development
- Produces boards with the precision expected in a laboratory
- Processing without chemicals



Fig:-1. Without cabin



## CAPABILITIES:

- Equipped with an Auto-Tool-Changing mechanism
- A magnification facility is available to view the printing on the surface of the board
- A cabin is provided to prevent dust and to reduce noise
- Printing on double side

## Location:

Room No : 401-A  
Academic Block-II  
School of Electrical Engineering

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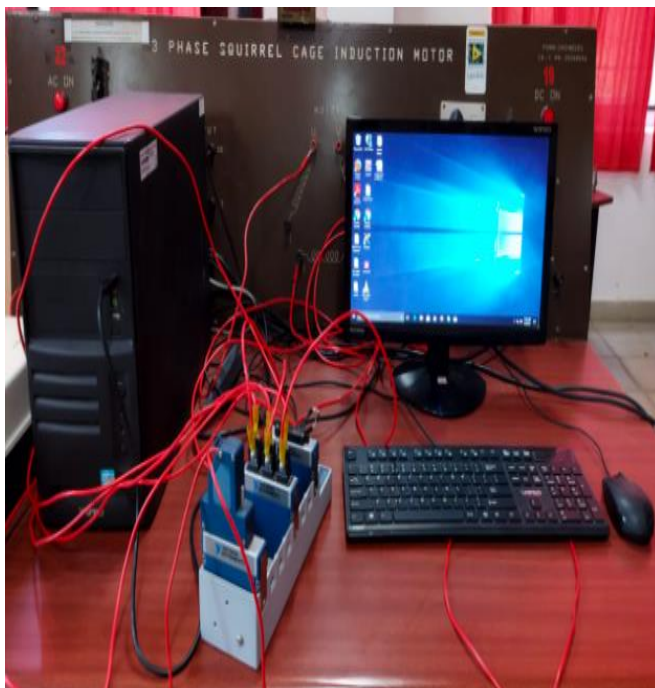
# NI-Interfacing module for 3-phase squirrel cage induction Motor

**Make:** NI instruments

**Model:** NI cDAQ 9178

## Specification /Features:

- The setup has NI 9244 - analog input for voltage measurement
- NI 9247 analog input for current measurement
- NI 9401 digital I/o for speed measurement
- NI 9178 cDAQ Chassis



## Capabilities:

- NI DAQ Lab view based interfacing module of three phase squirrel cage induction motor connected with the PC for studying the electrical and mechanical characteristics of three phase induction motor
- Possibility of viewing mechanical and electrical characteristics graph of the machine from the PC in real time
- Possibility of studying in real time, speed torque characteristics of the three phase induction machine, by the loading conditions

## Applications:

- The steady state and dynamic characteristics of three phase induction motor

### Location:

Room No.: 002  
Academic Block -1  
School of Electrical Engineering

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## NI-Interfacing module for DC Shunt Motor

**Make:** National Instruments

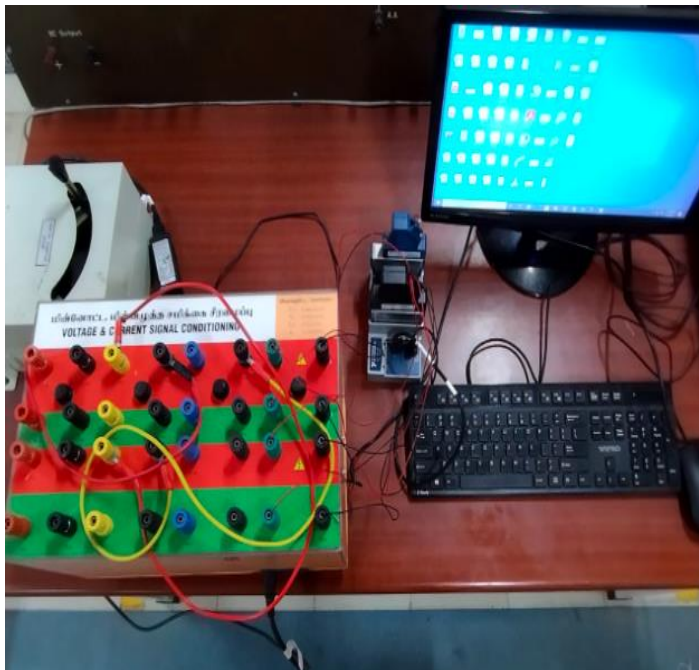
**Model:** NI cDAQ 9174

### **Specification /Features:**

The set-up has NI 9174 – Chassis to interface with PC

NI 9401 – Digital I/O module

NI 9220 – Analog input module



### **Capabilities:**

- NI DAQ Lab view based interfacing module of DC shunt motor connected with the PC for studying the electrical and mechanical characteristics of DC shunt motor
- Viewing the mechanical and electrical characteristics graph of the machine from the PC in real time
- Possibility of studying in real time, speed torque characteristics of the machine, by changing the loading conditions

### **Applications:**

- Study the steady state and dynamic characteristics of DC shunt motor in real time

### **Location:**

Room No.: 002  
Academic Block -1  
School of Electrical Engineering

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## 5 kW Photovoltaic System Roof Top Installation

**Make:** KCP Solar Industry

**Model:** 5 KW Solar PV system

**Specification /Features:**

- 20 Solar PV panel (each 250W with OC voltage of 35V and SC current of 8.02A)
- Flexible to create any power level (up to 5 kW) in multiple of 250W
- Oscilloscopes with voltage & current probes



### Capabilities:

- Solar PV with grid tied inverter for testing, control and performance evaluation
- Solar PV with DC-DC converter and /or grid tied inverter for testing, control and performance evaluation
- Interface, test and performance evaluation converters developed in laboratory
- Test controller algorithm with existing controllers and converters

### Applications:

Multiple disciplines of research such as

- Power system, Power electronics,
- Electric drives, Control & instrumentation, etc. with solar PV application

### Location:

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Academic Block 1  
School of Electrical Engineering  
Vellore Institute of Technology, Chennai

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# Three Phase Power Quality and Energy Analyzer

**Make:** Fluke

**Model:** 435-Series-II

## Specification /Features:

- Maximum input voltage: 1000 V rms
- Max. Peak measurement voltage: 6 kV (transient mode only)
- Input impedance: 4 M $\Omega$ /5 p
- Resolution: 16 bit analog to digital converter on 8 channels
- Maximum sampling speed: 200 kS/s on each channel simultaneously



## Applications:

- Performance of active and reactive power
- Power factor, energy, frequency, power quality measurements
- Energy loss calculations, measurement of harmonics, unbalance, loss analysis, etc. for distribution system

## Location:

Room No.: 703A, Academic Block I  
Protection and Switchgear Lab  
School of Electrical Engineering  
VIT Chennai

## Capabilities:

- Locating, predicting, preventing and troubleshooting power quality problems in three-phase and single-phase power distribution systems
- Measures and quantify energy losses due to harmonics and unbalance issues, allowing the user to pinpoint the origin of energy waste within a system.
- Captures fast RMS data, show half-cycle and waveforms to characterize electrical system dynamics.
- Ten power quality parameters on one screen according to EN50160 power quality standard

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