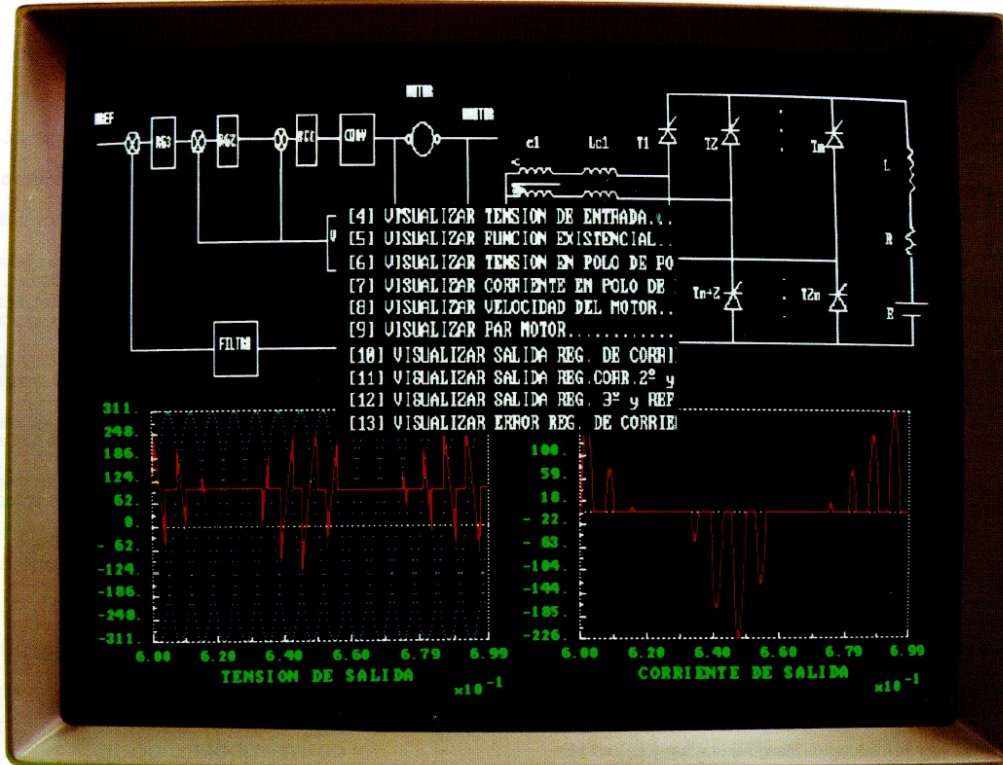


### POWER ELECTRONICS COMPUTER AIDED DESIGN AND SIMULATION



### PECADS INTRODUCE YOU TO THE SIMULATION WORLD.

CONVERTER TYPES (Basic and advanced versions):

- AC/DC Alternating Current/Direct Current.
- AC/AC Alternating Current/Alternating Current.
- DC/AC Direct Current/Alternating Current.
- DC/DC Direct Current/Direct Current.

\*Available in English and Spanish languages

### MAIN CHARACTERISTICS

- Specific Software packages for any type of converters.
  - Basic Version: Open loop practical tutorial.
  - Advanced Version: Close loop practical tutorials, including industrial applications. Adjustable control loops.
- Operates on any PC type and any graphic card.
- Real structure simulation. Simulated PC signals and scope real signals without appreciable differences.
  - Dynamic Simulation with successive cycles, without limit of time.
  - Graphic visualization with auto-scaling of magnitudes: voltages, currents, control, signals, etc.
- FFT Armonic analysis, maximal, average and RMS values for every signal in each simulation cycle.
- Didactic Hardware equipment, TECNEL, as a complement.
- Includes industrial applications simulation, in open and close loop.
  - AC/DC Battery Charger, DC Motors Control, Passive Loads, etc.
  - DC/AC UPS, Field Oriented Control of AC Motors, Passive Loads, etc.
  - DC/DC Chopper, Booster, Buck-Booster, Cuk, DC Motors Control, etc.
  - AC/AC Cycloconverters: UFC, SSFC, Triangular Modulation including CAM control, UPS, Field Oriented Control of AC Motors, Passive Loads, etc.
- Tutorial Books for self-study, including sufficient theoretical knowledge to study Electronic Power Currents and Industrial applications.
- Future expansions:
  - Using the professional package, you can design the regulation loops and the power semiconductors sizing:
    - System transfer function determined by identification.
    - Digital regulators, microprocessor based.
    - Dynamic and steady state semiconductor sizing.
    - Close loop simulation for the total system.

### REQUIRED SERVICES

- Running in MS-DOS window.
- LPT1 required or USB to LPT1 adapter.



ISO 9001:2000  
Certificate of Approval



European Union Certificate



Certificates ISO 14001: 2004 and  
ECO-Management and Audit Scheme  
(environmental management)



Worlddidac Quality Charter  
Certificate  
Worlddidac Member

## THEMATICAL CONTENTS

### (Experimental capabilities)

#### AC/DC CONVERTERS:

- 1.- Introduction and Handling Instructions.
- 2.- Power Converters: Conversion theory (Theory).
- 3.- Simulation Tools (Theory).
- 4.- AC/DC Converters (Theory).
- 5.- Single Phase Half Wave Rectifier with R-L load. (Practical tutorial I).
- 6.- Single Phase Half Wave Rectifier with R-L-E load. (Practical tutorial II).
- 7.- Three Phase Half Wave Rectifier R-L load. (Practical tutorial III).
- 8.- Three Phase Half Wave Rectifier R-L-E load. (Practical tutorial IV).
- 9.- Single Phase Bridge Rectifier with R-L load. (Practical tutorial V).
- 10.- Single Phase Bridge Rectifier with R-L-E load. (Practical tutorial VI).
- 11.- Three Phase Bridge Rectifier with R-L load. (Practical tutorial VII).
- 12.- Three Phase Bridge Rectifier with R-L-E load. (Practical tutorial VIII).
- 13.- Multi-loop Regulation Drives (Theory).
- 14.- Industrial Applications (Theory).
- 15.- Current Loop Analysis with L-R load. Continuous conduction (Practical tutorial IX).
- 16.- Two Current Loop Analysis with L-R load. Continuous and discontinuous conduction. (Practical tutorial X).
- 17.- Voltage External Loop Setting. Application: battery charger. (Practical tutorial XI).
- 18.- DC Motor Dynamic Open Loop Performance Analysis. (Practical tutorial XII).
- 19.- Speed External Loop Setting. Application: DC motor drives in two quadrants. (Practical tutorial XIII).
- 20.- DC Motor Operation in Four Quadrants. (Practical tutorial XIV).

#### AC/AC CONVERTERS:

- 1.- Introduction and Handling Instructions.
- 2.- Power Converters: Conversion theory (Theory).
- 3.- Simulation Tools (Theory).
- 4.- AC/AC Converters (Theory).
- 5.- Single Phase SSFC Converter with and without output filter. (Practical tutorial I).
- 6.- Single Phase UFC Converter with and without output filter. (Practical tutorial II).
- 7.- Single Phase Triangular Modulation Converter with and without output filter. (Practical tutorial III).
- 8.- CDFFC (Power Factor Control) one phase converter, with and without output filter. (Practical tutorial IV).
- 9.- Three Phase SSFC Converter with and without output filter. (Practical tutorial V).
- 10.- Three Phase UFC Converter with and without output filter. (Practical tutorial VI).
- 11.- Three Phase Triangular Modulation Converter with and without output filter. (Practical tutorial VII).
- 12.- Three Phase CDFFC with and without output filter. (Practical tutorial VIII).
- 13.- Multi-loop Regulation Drives (Theory).
- 14.- Field Oriented Theory Applied to the AC motor drives (Theory).
- 15.- Industrial Applications: voltage source AC motor control SSFC converter. (Practical tutorial IX).
- 16.- Industrial Applications: voltage source AC motor control UFC converter. (Practical tutorial X).
- 17.- Industrial Applications: voltage source AC motor control triangular modulation. (Practical tutorial XI).
- 18.- Industrial Applications: voltage source AC motor control CDFFC. (Práctica XII).

#### DC/AC CONVERTERS:

- 1.- Introduction and Handling Instructions.
- 2.- Power Converters: Conversion theory (Theory).
- 3.- Simulation Tools (Theory).
- 4.- DC/AC Converters (Theory).
- 5.- Harmonics filtering and adaptive control in sliding mode.
- 6.- Single Phase DC/AC Converter: one pulse by semicycle with and without output filter. (Practical tutorial I).
- 7.- Single Phase DC/AC Converter: natural and uniform sampling with and without output filter. (Practical tutorial II).
- 8.- Single Phase DC/AC Converter: sliding adaptive control for existence functions generation. (Practical tutorial III).
- 9.- Two Phase DC/AC Converter: one pulse by semicycle with and without output filter. (Practical tutorial IV).
- 10.- Two Phase DC/AC Converter: natural sampling with and without output filter. (Practical tutorial V).
- 11.- Two Phase DC/AC Converter: sliding adaptive control for existence functions generation. (Practical tutorial VI).
- 12.- Three Phase DC/AC Converter: one pulse by semicycle. Line voltages analysis with and without output filter. (Practical tutorial VII).
- 13.- Three Phase DC/AC Converter: natural and uniform sampling. Phase voltages analysis with and without output filter. (Practical tutorial VIII).
- 14.- Three Phase DC/AC Converter: sliding adaptive control for existence functions generation. (Practical tutorial IX).
- 15.- Multi-loop Regulation Drives (Theory).
- 16.- Field Oriented Theory Applied to the AC motor drives and UPS (Theory).
- 17.- Industrial Applications: two phase UPS. (Practical tutorial X).
- 18.- Industrial Applications: three phase UPS. (Practical tutorial XI).
- 19.- Industrial Applications: current source AC motors control. (Practical tutorial XII).
- 20.- Industrial Applications: voltage source AC motors control. (Practical tutorial XIII).

#### DC/DC CONVERTERS:

- 1.- Introduction and Handling Instructions.
- 2.- Power Converters: Conversion theory (Theory).
- 3.- Simulation Tools (Theory).
- 4.- DC/DC Converters (Theory).
- 5.- Chopper R-L Load. (Practical tutorial I).
- 6.- Chopper R-L-E Load. (Practical tutorial II).
- 7.- Booster R Load. (Practical tutorial III).
- 8.- Booster R-L-E Load. (Practical tutorial IV).
- 9.- Buck-boost R Load. (Practical tutorial V).
- 10.- Buck-boost R-L-E Load. (Practical tutorial VI).
- 11.- Cuk R Load. (Practical tutorial VII).
- 12.- Cuk R-L-E Load. (Practical tutorial VIII).
- 13.- Multi-loop Regulation Drives (Theory).
- 14.- Industrial Applications (Theory).
- 15.- Current Loop Analysis with R-L load continuous conduction. (Practical tutorial IX).
- 16.- Two Current Loop Analysis with R-L load. Continuous and discontinuous conduction. (Practical tutorial X).
- 17.- Voltage External Loop Setting. Application battery charger. (Practical tutorial XI).
- 18.- DC Motor Dynamic Open Loop Performance Analysis. (Practical tutorial XII).
- 19.- Speed External Loop Setting. Application: DC motor drives in two quadrants. (Practical tutorial XIII).

\*Specifications subject to change without previous notice, due to the convenience of improvements of the product.



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