PEK-130

NEW

FEATURES

- Provide Analysis, Design, Simulation and Implementation Verification for Power Electronics

- Allow Students With no DSP Firmware Programming Capability to Easily Complete Programming so as to Swiftly Proceed To Digital Control Domain

- Provide Comprehensive Trainings and After-sales Maintenance Services

- Provide a Complete Experiment Kit List

- Provide Circuit Diagram Files for Each Course Kit

- Provide DSP Hardware Planning, Setting and Program Burning Method

- Provide Detailed Principle and Design of Experiment Circuits

Power converter utilizing digital control is the development trend of the present industrial products. Digital control can elevate the function and performance of power converter to increase product's added value. More and more power converters are using the digital control technology. The objective of this course kit is to provide a learning platform for power converter using digital control. Users, via PSIM software and simulation, learn the principle, analysis and design of power converter. Furthermore, the SimCoder tool of PSIM can be used to convert control circuit to digital control program as well as to operate a second simulation for circuit, which will be replaced by DSP. Finally, control program, via simulation verification, can be burned into DSP chip. DSP, via control and communications, verifies the correctness of designed circuit and controller.

PEK-130 is the development module of full digital controlled three-phase inverter, aiming at the training of circuit analysis, design, simulation and experiment for researchers to conduct problem-oriented learning. The quantitative design of power circuit and controller is based upon converter's specifications. Users can further understand the related technology of three-phase inverter through PSIM simulation verification and SimCoder programming processes.

With the comprehensive capabilities of realizing simulation, design, hardware circuit, PSIM is a simulation software specifically designed for systems such as power electronics, motor driver and power conversion. PSIM features comprehensive functions, complete components, fast simulation, accurate simulation results and easy to use, and this software is often used by the international academics and industries for education and research.

THE SPECIFICATIONS OF THREE-PHASE INVERTER DEVELOPMENT MODULE

PEK-130 Three Phase Inverter						
Description	Symbol	Min	Typ	Max	Units	Comment
DC Input — Voltage	V_{IN}	90	100	110	V	
DC Input — Current	I_{IN}			3	A	
AC Output — Voltage	V_{L-L}		50		V	
AC Output — Current	I_{OUT}	0		2.9	A	
AC Output — Power	P_{OUT}			250	W	
Dimensions (L × W × H)		285 (mm) × 170 (mm) × 110 (mm)				
Weight		Approx. 2.5kg				

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Experiment 1: Three Phase SPWM Inverter
Experiment objective is to learn the principles of three-phase SPWM, SVPWM and zero sequence injection. Via PEK-130 module, students learn the voltage and current measurement method and the settings of TI F28335 DSP IC pin locations, PWM and A/D hardware as well as to understand how to conduct the control and measurement of DSP´s internal signal by RS-232. (Refer to the fig.1 for connection)

Experiment 2: Three Phase Stand-alone Inverter
Experiment objective is to learn the module establishment of three-phase inverter and the design of voltage and current loop controllers. After designing hardware SimCoder is utilized to conduct programming. (Refer to the fig.1 for connection)

Experiment 3: Grid Connected Three Phase Inverter
Experiment objective is to understand the basic principle and structure of three-phase city grid paralleled with inverter; the design method of phase-locked loop of three-phase paralleled inverter, and the design of voltage and current loop controllers. After the designing city grid paralleled   with inverter SimCoder is utilized to conduct programming. (Refer to the fig.2 for connection)

Experiment 4: Single-phase Three-arm Rectifier-Inverter
Experiment objective is to understand the working mode of UPS and to learn the design of inverter´s voltage loop and current loop as well as the design of rectifier's AC voltage control loop. SimCoder is utilized to conduct programming. (Refer to the fig.3 for connection)
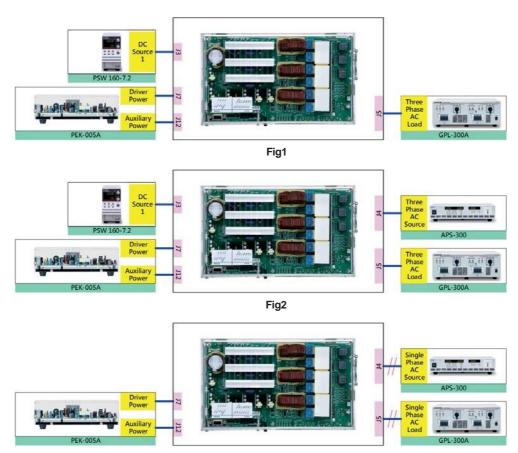

Fig1

Fig2

Fig3

ORDERING INFORMATION

PEK-130   Three-Phase Inverter Developer's Kit

STANDARD ACCESSORIES

terminal, RS-232 communications cable

OPTIONAL ACCESSORIES

PEK-003   TMS320F28335 experiment board that isolates RS-232 interface
PEK-005(A)   Multi-output auxiliary power supply
PEK-006   Isolated JTAG emulated adapter

* The required accessories for digital control module: PEK-005(A)x1 and PEK-006x1

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