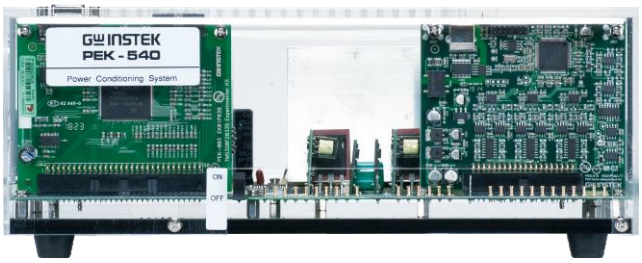
PEK-540 POWER CONDITIONING SYSTEM DEVELOPER'S KIT



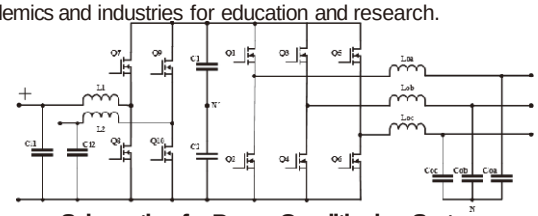
NEW

PEK-540

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 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-540 is the development module of full digital controlled power conditioning system, 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 power conditioning system through PSIM simulation verification and SimCoder programming processes.
With the comprehensive capabilities of realizing simulation, design, hardware circuit, PSIM is simulated 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.



Schematic of a Power Conditioning System

THE SPECIFICATIONS OF POWER CONDITIONING SYSTEM

PEK-540 Power Conditioning System							
Bi-derection DC/DC Converter							
Description		**Symbol**	**Min**	**Typ**	**Max**	**Units**	**Comment**
DC Input	Voltage	V_{IN}	50		80	V	
	Current	I_{IN}			6	A	
DC Output	Voltage	V_{OUT}	90	100	110	V	
	Current	I_{OUT}			2.8	A	
	Power	P_{OUT}			250	W	
Three Phase Inverter							
Description		**Symbol**	**Min**	**Typ**	**Max**	**Units**	**Comment**
DC Input	Voltage	V_{IN}	90	100	110	V	
	Current	I_{IN}			3	A	
AC Output	Voltage	V_{L-L}		50		V	
	Current	I_{OUT}	0		2.9	A	
	Power	P_{OUT}			250	W	
Dimensions(L x W x H)			310 x 310 x 110 (mm)				
Weight			Approx. 5kg				
Experiment	1. Interleaved Buck Converter						
	2. Interleaved Boost Converter						
	3. Bi-directional DC-DC Converter						
	4. Three Phase Four Wire Boost Stand-alone Inverter						
	5. Three Phase Four Wire PV Grid-connected Inverter						
	6. Three Phase Four Wire Battery Energy Storage System						
	7. Three Phase Four Wire Hybrid System						

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EXPERIMENTS

Experiment 1 : Interleaved Buck Converter
To get to know the main circuit of interleaved buck converter, and learn the voltage and current dual-loop control method. To realize the DSP digital control circuit planning and learn the method of digital control programming via PEK-540 module. To well get familiar with the experiment devices and software manipulation. (Refer to the fig. 1 for wiring)

Experiment 2 : Interleaved Boost Converter
To get to know the main circuit of interleaved boost converter, and learn the voltage and current dual-loop control method. To realize the DSP digital control circuit planning and learn the method of digital control programming via PEK-540 module. To well get familiar with the experiment devices and software manipulation. (Refer to the fig. 2 for wiring)

Experiment 3 : Bi-directional DC-DC Converter
To get to know the main circuit of bi-directional DC-DC converter, and learn the control method. To realize the DSP digital control circuit planning and learn the method of digital control programming via PEK-540 module. To well get familiar with the experiment devices and software manipulation, further proceeding to the code programming via SimCoder, after well mapping out the bi-directional DC-DC converter. (Refer to the fig. 3 for wiring)

Experiment 4 : Three phase Four Wire Boost Stand-alone Inverter
To get to know the three phase four wire boost stand-alone inverter integrated by the first-stage boost converter with the three-phase inverter, and learn the control method of inverter, further verifying the experiment result via PEK-540 module. (Refer to the fig. 4 for wiring)

Experiment 5 : Three phase Four Wire PV Grid-connected Inverter
To get to know the characteristics of PV module and diversified MPPT method, and learn the code programming of Perturb and Observe method via SimCoder. Also, to realize MPPT via the PEK-540 boost converter, further fulfilling the experiment of three phase PV grid-connected inverter through integration with the second-stage three phase grid-connected inverter. (Refer to the fig. 5 for wiring)

Experiment 6 : Three phase Four Wire Battery Energy Storage System
To get to know the fundamental with structure of three phase four wire battery energy storage system, and synthesize the bi-directional DC-DC converter with three phase inverter, further proceeding to the code programming via SimCoder, after well planning. (Refer to the fig. 6 for wiring)

Experiment 7 : Three phase Four Wire Hybrid System
Synthesize the PV power system with the battery energy storage system to form the hybrid micro-grid system, further proceeding to the code programming via SimCoder, after well mapping out the PEK-540. (Refer to the fig. 7 for wiring)

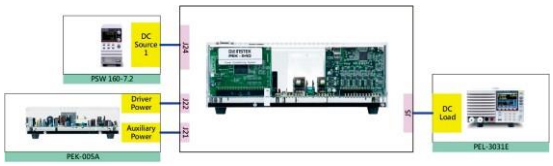

Fig1

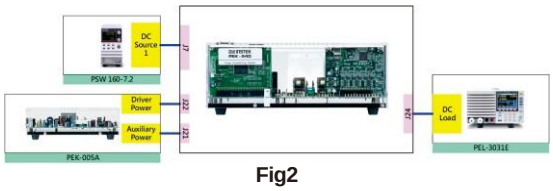

Fig2

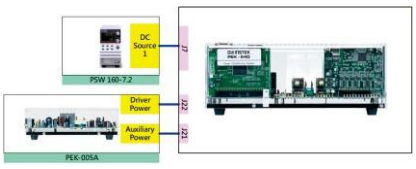

Fig3

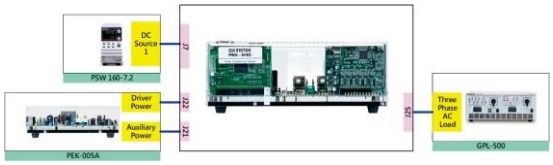

Fig4

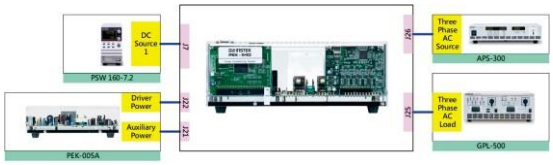

Fig5

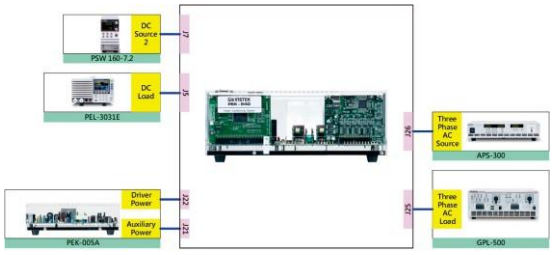

Fig6

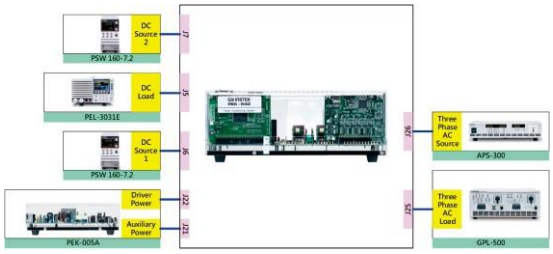

Fig7

ORDERING INFORMATION

PEK-540 Power Conditioning System Developer's Kit

STANDARD ACCESSORIES

Terminal, RS-232 Communications Cable

OPTIONAL ACCESSORIES

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

* The required accessories for PEK-540 digital control module: PEK-005(A) x1 and PEK-006 x1

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