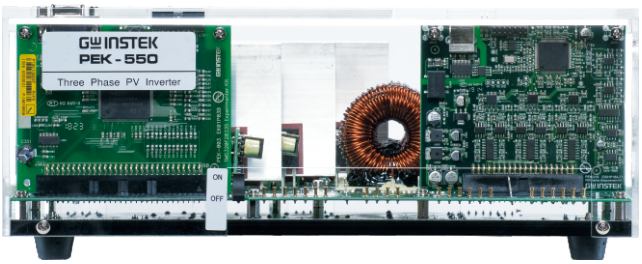
PEK-550 THREE-PHASE PV INVERTER DEVELOPER'S KIT



NEW

PEK-550

FEATURES

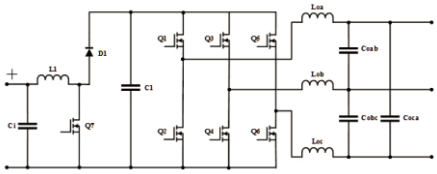
- Provide Analysis, Design, Simulation and Implementation Verification for Power Electronics
- Allow Students With no DSP Firmware Programming Capability to Easily Complete Programming so as to Swiftly Proceed to Digital Control Domain
- Provide Comprehensive After-sales Maintenance Services
- Provide 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-550 is the development module of full digital controlled three-phase PV 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 single-phase PV Inverter through PSIM simulation verification and SimCoder programming processes.

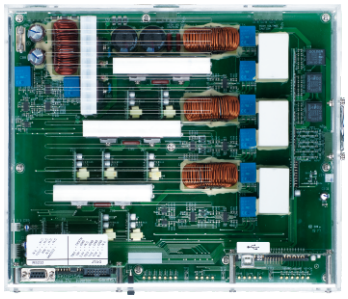
With the comprehensive capabilities of realizing simulation, design, hardware circuit, PSIM is simulated software specifically designed for systems such as power electronics, motor driver and power conversion. PSIM features comprehensive functions, complete components, fast simulation, accurate simulation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



Schematic of a Three Phase PV Inverter

THE SPECIFICATIONS OF THREE-PHASE PV INVERTER DEVELOPMENT MODULE

PEK-550 Three Phase PV Inverter							
Boost Converter							
Description		**Symbol**	**Min**	**Typ**	**Max**	**Units**	**Comment**
DC Input	Voltage	V_{IN}	70	80	90	V	
	Current	I_{IN}			4	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 (mm) x 265 (mm) x 110 (mm)				
Weight			Approx. 4kg				



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EXPERIMENTS

Experiment 1 : Three Phase SVPWM Inverter

To get to know the main circuit of three phase inverter, and learn three-phase SPWM, SVPWM as well as three phase axis transformation. To realize the DSP digital control circuit planning and learn the method of digital control programming via PEK-550 module. To well get familiar with the experiment devices and software manipulation. (Refer to the fig. 1 for wiring)

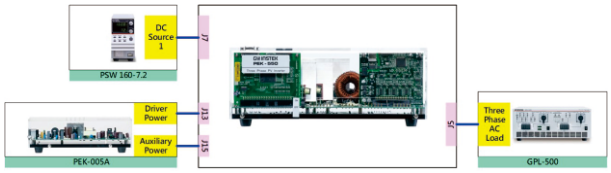

Fig1

Experiment 2 : Three Phase Boost Stand-alone Inverter

To get to know the way for modeling of three phase inverter, and learn the design of both voltage loop and current loop controllers, further proceeding to the code programming via SimCoder, after well mapping out the hardware. (Refer to the fig. 2 for wiring)

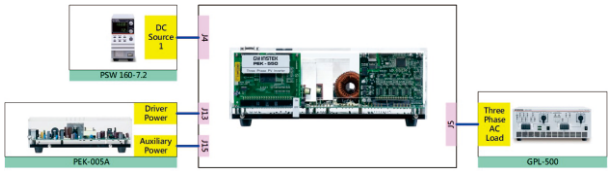

Fig2

Experiment 3 : Three Phase Grid-connected Inverter

To get to know the fundamental with structure of three phase grid-connected inverter, and learn not only the design method of phase-lock loop of three phase grid-connected inverter, but the design of both voltage loop and current loop controllers as well, further proceeding to the code programming via SimCoder, after well mapping out the three phase grid connected inverter. (Refer to the fig. 3 for wiring)

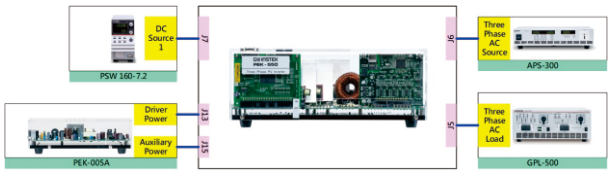

Fig3

Experiment 4 : PV Boost Converter

To get to know the characteristics of PV module and diversified MPPT method, and learn the code programming of Perturb and Observe method, further verifying the experiment result via step-up converter of PEK-550. (Refer to the fig. 4 for wiring)

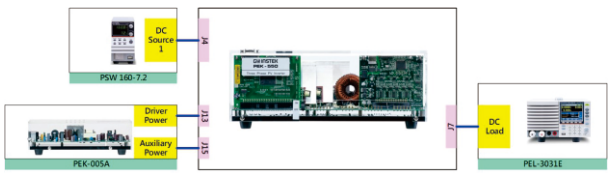

Fig4

Experiment 5 : Three Phase Islanding Protection Inverter

To get to know the purpose and way to test verification of PV islanding protection, further proceeding to the code programming via SimCoder, after well mapping out the hardware. (Refer to the fig. 5 for wiring)

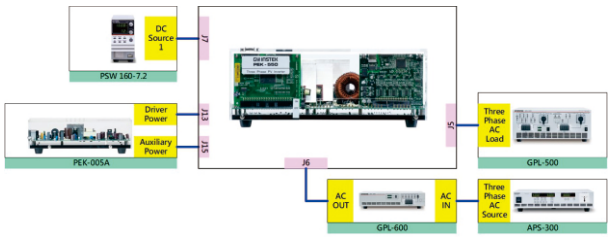

Fig5

Experiment 6 : Three Phase PV Grid-Connected Inverter

To get to know the fundamental with structure of three phase PV grid-connected inverter, and synthesize step-up converter with three-phase inverter to form the experiment of three phase PV grid-connected inverter, further proceeding to the code programming via SimCoder, after well planning. (Refer to the fig. 6 for wiring)

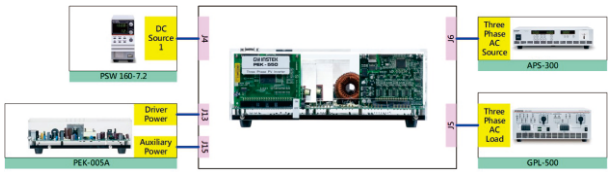

Fig6

ORDERING INFORMATION

PEK-550 Three Phase PV Inverter Developer's Kit

STANDARD ACCESSORIES

CD ROM (Including PSIM Example Files and User Manual), 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 digital control module : PEK-005(A) x 1 and PEK-006 x 1

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