

Power Electronics Laboratory

Power Electronics is one of a key subject of electrical engineering. Power electronics is of vital importance to understanding of control, conversion and conditioning of power in electrical industries. The power electronics laboratory is actively engaged to reinforce and enhance understanding of the fundamentals of semiconductor switches and power converters. This laboratory deal with practical realization of theory concept related with power electronics. The all experimental set-ups are designed and developed by the institute according to the standards. The power electronics laboratory is equipped with different converters setups like as rectifier, inverter, A.C voltage converter, DC-DC converter, Switching characteristics, BLDC drive and DC motor drive, where students can visualize the basics principles of different converters.



Device characteristics kit

The trainer kit is used to understand the behavior of different power electronics switches. The trainer consists of a SCR/TRIAC characteristics section, MOSFET/IGBT characteristics section, DIAC characteristics section, MOSFET switching section and power device section. Ammeters and voltmeters are connected from outside to observe the behavior of individual switches at varying supply voltage.

Gate triggering circuits kit

The trainer kit is used to understand the latching/turn-on process of different semiconductor switches. The trainer consists of a control supply, DC triggering circuit, R triggering circuit, RC triggering circuit, UJT triggering circuit, SCR power circuit, MOSFET power circuit and MOSFET/IGBT gate driver circuit. Separate CRO or digital signal oscilloscope is used to observe the latching/turn-on process of individual switches. This kit provides conventional to modern triggering technique of switches.

Single Phase Inverter Kit

The trainer kit is used to understand the principle and behavior of single phase inverter which converter DC supply into AC supply. The trainer consists of power circuit of inverter, microcontroller based control circuit, power supply section, load section and protection circuit. All different types of control signals are generated using single control circuit by changing the program of individual switching pulse like square wave, QSW and SPWM. Separate CRO or digital signal oscilloscope is used to observe the behavior of converter.

Three Phase Inverter Kit

The trainer kit is used to understand the principle and behavior of three phase inverter which converter DC supply into AC supply. The trainer consists of power circuit of inverter, microcontroller based control circuit, power supply section, load section and protection circuit. All different types of control signals are generated using single control circuit by changing the program of individual switching pulse like square wave, QSW and SPWM. Separate CRO or digital signal oscilloscope is used to observe the behavior of converter. Three Phase Inverter behavior can also analyzed at different load condition like R and RL.

Single Phase Rectifier Kit

The trainer kit is used to understand the principle and behavior of single phase rectifier which converter AC supply into DC supply. The trainer consists of power circuit of rectifier, microcontroller based control circuit, power supply section, load section and protection circuit. All different types of control signals are generated using single control circuit by changing the program of individual switching pulse. Single Phase Rectifier behavior can also analyze at different load condition like R and RL. Also understand the function of free-wheeling diode using this trainer kit. Separate CRO or digital signal oscilloscope is used to observe the behavior of converter.

Three Phase Rectifier Kit

The trainer kit is used to understand the principle and behavior of three phase rectifier which converter AC supply into DC supply. The trainer consists of power circuit of rectifier, microcontroller based control circuit, power supply section, load section and protection circuit. All different types of control signals are generated using single control circuit by changing the program of individual switching pulse. Three Phase Rectifier behavior can also analyze at different load condition like R and RL. Also understand the function of free-wheeling diode using this trainer kit. Separate CRO or digital signal oscilloscope is used to observe the behavior of converter.

Switch mode DC-DC converter kit

The trainer kit is used to understand the principle and behavior of DC-DC converter which converter fixed DC supply into variable DC supply. The trainer consists of power circuit of DC-DC converter, microcontroller based control circuit, power supply section, load section and protection circuit. Output voltage can be changed by varying duty ratio of switching pulse, is done by control circuit of converter. Continuous conduction mode and discontinuous conduction mode operation also performed for all DC-DC convert using single kit. Separate CRO or digital signal oscilloscope is used to observe the behavior of converter.

Three Phase AC Voltage Converter

The trainer kit is used to understand the principle and behavior of AC voltage converter which converter fixed AC supply into variable AC supply. Same kit is also performed as single phase AC voltage controller also. The trainer consists of power circuit of AC-AC converter, microcontroller based control circuit, power supply section, load section and protection circuit.

Different load connections like star-delta are performed on the same kit. Separate CRO or digital signal oscilloscope is used to observe the behavior of converter.

Single Phase Controlled Rectifier Fed Separately Excited DC Motor Drive

The trainer kit is used to understand the concept to control the speed of separately excited DC motor using single phase controlled rectifier. The trainer consists of power circuit of field and armature side converters, microcontroller based control circuit, power supply section, SEDC motor and speed sensor. Open loop as well as close loop control of separately excited DC motor is performed on the same kit. Separate CRO or digital signal oscilloscope is used to observe the behavior of this drive.

Brush Less DC Motor Drive Kit

The trainer kit is used to understand the basic operation and speed control mechanism of BLDC motor. The trainer consists of voltage source inverter section, BLDC motor, hall sensors, microcontroller based control circuit and power supply. Forward as well as reverse rotation of BLDC motor can be achieved using this drive. Separate CRO or digital signal oscilloscope is used to observe the operation of drive