

Fundamentals of Power System Management

21 March 2017

The department of EEE conducts a program on Fundamentals of Power System Management on 21 March 2017.



The entire program concentrates on power system management. Power management plays a major role in virtually every electronic system because it controls, regulates, and distributes dc power throughout the system. Therefore, the dc power management subsystem can affect the reliability, performance, cost, and time-to-market of the associated electronic equipment.

Power management subsystems enable an electronic system to function properly by supplying and controlling its dc power. An analogy is that a power management subsystem functions in a manner similar to the body's blood vessels that supply the proper nutrients to keep the body alive. Likewise, the power management subsystem supplies and controls the power that keeps an electronic system alive.

The key component of the dc power management system is the power supply that provides dc power for the associated system. The specific type of dc power management subsystem depends on its power input, which includes. Battery input (for portable equipment) – Because of size and weight restrictions of portable equipment this power management subsystem is usually integrated with the rest of the electronic system. Some of these systems also include an ac adapter, which is a small power unit that plugs into the ac wall outlet and provides a dc output voltage. Usually, the ac adapter is used to power the unit and can also recharge the system battery.AC input – This subsystem employs a power supply that accepts an ac utility power input, rectifies and filters it, then applies the resulting dc voltage to a regulator circuit that provides a constant dc output voltage. There are a wide variety of ac-dc supplies that can have an output voltage from less than 1V to thousands of volts. This dc power management system usually employs a switch-mode power supply, although some linear supplies are

available. DC input .This power management subsystem employs a power supply that accepts a dc voltage input, typically 5 V, 12V, 24V, or 48 V and produces a dc output voltage. At the low end, a supply of this type can produce less than 1Vdc, whereas other dc-dc supplies can produce thousands of volts dc. This power management subsystem usually employs a switch-mode power supply. Ultralow voltage input (energy harvesting) - Energy harvesting can provide the power to charge, supplement or replace batteries. A key component in energy harvesting is a power converter that can operate with ultralow voltage inputs. In operation, this power converter captures minute amounts of energy, accumulates it, stores it and then maintains the stored energy as a power source. Low voltage inputs can come from solar power, thermal energy, wind energy, or kinetic energy.