

Low Voltage Direct Current (LVDC) distribution system to reduce net energy power consumption through energy efficient DC loads by effective utilization of solar power

LVDC

Low Voltage Direct Current

In most buildings, including our homes, we are surrounded by devices and equipments that internally operates on DC. Examples of these devices are PCs, LED lights, televisions, mobile phones, and other electronic appliances. Renewable sources like PV systems, electricity is generated as DC and it is converted into AC to supply the existing systems/networks. All these conversions are associated with power loss. These losses can be significantly reduced by LVDC home architecture.

As a promising technology of future C-DAC (T) has developed an LVDC architecture for residential applications under the aegis of NaMPET Phase II, Govt. of India.



Salient Features

- ▶ **48 V DC Power Architecture**
- ▶ **Multilayer communication network:**
 - ▲ Internal communications by means of CAN BUS
 - ▲ Wireless communication is enabled through Zigbee
- ▶ **LVDC System Controller:** A dedicated controller to perform integration of sources, subsystems and loads supported by wired (CAN) and wireless (Zigbee) communication
- ▶ **LVDC Power Converter:** Main converter which will supply the required power for the LVDC system with multi input (solar PV & battery) and efficient power management
- ▶ **Room Controller:** The room controller in the system takes up the command from the master controller and manages their zone
- ▶ **Power Sockets & Switches:** LVDC power switches and sockets are intelligent outlets that have the ability to measure and control electrical devices connected in this switch. This switch is having power line and LVDC data line
- ▶ **LVDC Architecture can be configured for following use cases:**
 - ▲ LVDC architecture for on grid /off grid
 - ▲ Low cost LVDC system (Power architecture only)
 - ▲ High cost LVDC system (with smart home features)
- ▶ **Devices in LVDC Home:** Fan (BLDC) , LED Tube, LED Lamp, Desktop PC etc.

Advantages of LVDC Home

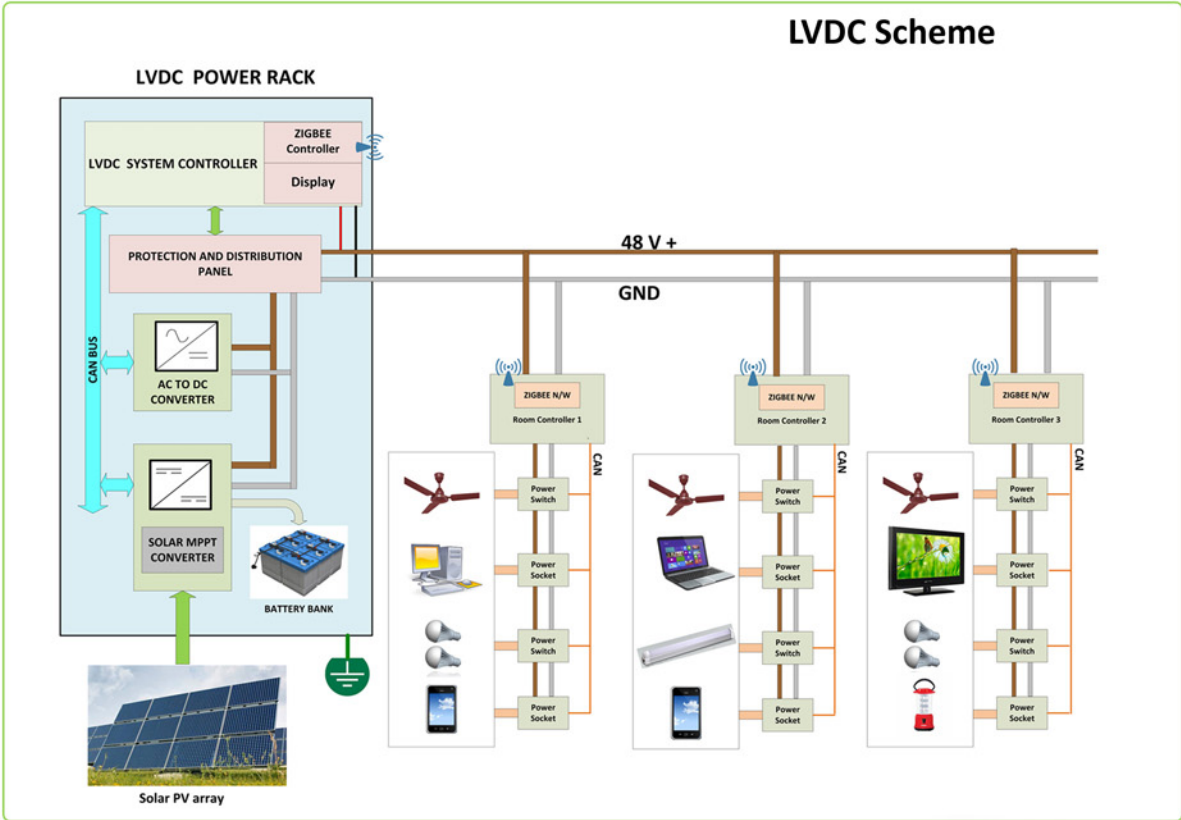
- ❖ Reduced AC-DC conversion stages
- ❖ Improved energy savings due to high efficiency of DC equipments
- ❖ Direct interconnection with non-conventional resources like solar PV
- ❖ Easily compatible with efficient home equipments like BLDC fans, LED lights
- ❖ Better power quality (No power factor and harmonics related issues)
- ❖ Safe and secure voltage level ensures human safety



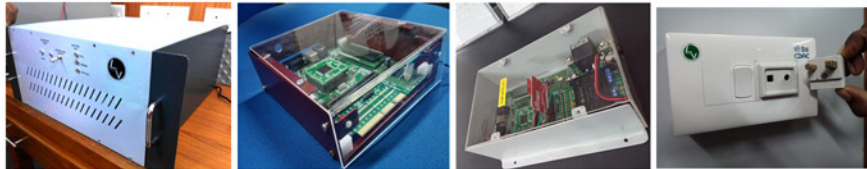
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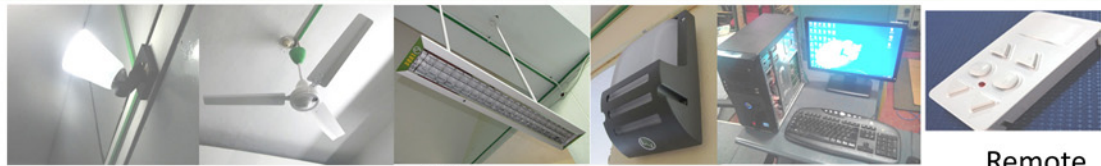
Applications



Sub Systems



48 V DC Loads



Remote

Deployed Institutes



NIT Calicut



CDAC Thiruvananthapuram

