A reconfigurable controller architecture (on FPGA) that can replace the conventional embedded microcontroller/ Digital Signal Processor based controller design for real-time control and monitoring of Power Electronic (PE) system. Technology developed by CDAC(T), Sponsored under NaMPET.

**ADVANTAGES**
- Reconfigurable hardware for various PE applications.
- Reduced processor obsolescence risk.
- FPGA independent design.
- Faster performance.
- Faster concept to system design.
- Generic board design handles a variety of PE applications.

**FEATURES**
- Soft processor integrated reconfigurable PE Controller.
- Application dependent processor design.
- An exclusive Power Electronics specific IPs Library (PWM generator, PI, ADC, DAC Controller, SPI, UART etc).
- Custom made instructions/functions for PE IP Library.
- Explores the idea of Hardware parallel processing than software pipelining.
- Reduced software/coding overhead.

**KNOWHOW**
- How to integrate a processor IP in FPGA.
- How to develop custom IP peripheral for processor.
- How to develop POSIX compatible APIs for processor.
- How to develop real-time control application in HSRPEC.

**CONTROLLER CARD:** Fixed design hardware for variety of PE control applications

- **FPGA:** Cyclone III EP3C25E144C8N (24,624 LEs)
- **On chip Memory:** 64 kBytes (inside FPGA)
- **Flash memory:** 2 MB
- **Digital I/Os:** 55 No.s (3.3-V LVTTL)
- **Host Interface:** JTAG
- **Supply voltage:** 3.3 V

**INTERFACE CARD:** Interface Card interfaces the controller to the Power Electronic systems

- **Analog Input:** +10V (ADC 13 bit 8 Channel, SPI interface)
- **Analog Output:** +3.3V (DAC 12 bit 8 channel, SPI interface)
- **Digital Input:** +5 V 2 no.s
- **Digital Output:** +5 V 12 no.s
- **Supply voltage:** 12 V

"Custom design for interface card is also possible depending on the Application."

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As a Digital Controller for

1. Solar MPPT Applications
2. High Frequency Inverter
3. High Performance AC Drive
4. DC Drive
5. UPS
6. DC-DC Converters
7. Multi level Inverters
8. Interleaved DC-DC Converters
9. Cyclo Converters
10. Matrix Converters
11. Smart metering
12. Power Factor Correction (PFC)
13. Power Quality Applications
14. Controller with Custom/standard Communication Protocol