DEPARTMENT OF ELECTRICAL ENGINEERING, IIT DELHI
Date: 06/03/2013
Extension

Department of Electrical Engineering of IIT Delhi is planning to set up a RT-Lab based on "Opal RT" for real time simulation studies of power system. The Specifications are as below.

Software:
➤ Modeling environment should be based on Matlab/Simulink/SimPowerSystems.
➤ FPGA programming environment interface optionally must be available.
➤ Models for easy learning of students in field of Drives, Power Electronics, Power System and Renewable Energy must be provided.
➤ Solver should be able to use trapezoidal rule of integration method upto 5th order.
➤ Ability to mix nodal solver and state-space solvers depending on simulation requirements.
➤ Software should be capable of generating PWM pulses independent of simulation clock
➤ Should be capable to simulate the effect of IGBT dead time using a unique solver approach with Time stamping & interpolation
➤ Should be optimized for parallel and real-time simulation of interconnected multi-drive systems with hundreds of switches
➤ Should have optional provision for scripting language (e.g. Python, etc)
➤ Should have an option for the connectivity with visualization & supervision software: LabVIEW, Scopeview, etc,
➤ Should have an option to support API Languages: C/C++, Java, etc
➤ Software based on the Eclipse integrated development environment (IDE).

Hardware
Processing Unit:
➤ One Chassis with Intel quad-Core processor or more.
➤ Can be scaled up to 84 processors or more
➤ Should have Real-time Operating System
➤ Should have INTEL processor On-Chip and On-board Fast shared memory, used for inter processor communication, or better.
➤ Can be optionally capable to support PCI & PCIe Communication interfaces.
➤ Should have an option to allow users to implement their own models, solvers & signal processing on FPGA chips to achieve sub microsec time step
➤ Should have 1 Gbps standard Ethernet connection to transfer the models from Host computer to the simulator.
➤ Should have PCI expansion slots for the provision of adding more flexibility to add I/Os and communication devices

I/O unit:
➤ Should have 1 FPGA Driver board- Capable of driving at least 256 I/O lines
➤ FPGA based I/O cards.
➤ Ultra-fast FPGA based ADC/DAC/DI/DO with step-size precision in range of 10 ns.

- Should Include the customizable signal generation & signal processing functions such as PWM, quadrature decoders & encoders, time stamped DIO, frequency /duty measurement etc
- Minimum count of I/O must be 16 Analog Channels & 32 Digital Channels.
- Can be optionally compatible with FPGA modeling environment
- Should have IEEE standard interface compatibility between the nodes for expansion.
- Can be optionally connected to I/O interface accessories such as mapping boxes, breakout boxes (BOB), screw terminals DB-37
- Can be optionally capable to support IEC 61850 Compliant protection Equipments

TERMS & CONDITIONS

1. Please submit the TECHNICAL and FINANCIAL bids in separate sealed envelopes. Mark the two envelopes clearly as "Technical Bid" and Financial Bid". Both the sealed envelopes should be sent in a single sealed envelope, with clearly marked as "Quotations for USRP Kits". The quote should reach the following address on or before **March 18, 2013** upto **5:00 PM.**

Name	:	Prof. Sukumar Mishra
Address	:	Deptt. of Electrical Engineering
		Indian Institute of Technology, Delhi
		Hauz Khas, New Delhi-110016 (India)

2. Please quote prices at FOB/ CIF New Delhi, inclusive of installation charges.
3. Quote should be in Indian Rupees as well as US Dollars and to be valid for at least three months.
4. Attach all the technical literature and a list of similar installations done in India.
5. A minimum of three years comprehensive onsite warranty, also exclude warranty for three months.
6. Mention if you can provide any technical support like training of IIT Delhi personnel at IIT Delhi or in your factory and providing a technical person for operation of the machine for the initial period of 2 years. Kindly mention about this in technical bid.
7. If the quote is being submitted by the representative of the Principals/manufactures themselves, a valid Agency ship/Dealership Certificate authorizing the agent to quote to IIT Delhi on behalf of the Principals should be enclosed.
8. The Institute reserves the rights to accept/reject any/all quotations without assigning any reasons thereof.
9. Complete set of manuals for the operation and servicing of equipment should be given. All circuit diagrams, other mechanical and electrical schematics must be provided to Main unit, sub systems and accessories.
10. Delivery as early as possible in weeks on receipt of PO.
11. Clearly specify the installation requirements – such as space, power, frequency, environment (Temperature and humidity) etc.
12. If the items quoted are proprietary in nature, please enclose proprietary certificate from the principals stating "Certified that ------------ is a proprietary item of M/s -------------- and no other manufacture make these items".

13. If the bidder is Indian agent, the agency certificate should be enclosed.
14. Please produce compliance certificate for the specification.
15. Please ensure that the Indian agent has been enlisted with the Department of Expenditure, evidence may please be attached.
16. All bank charges payable in India are to buyer's account and bank charges in seller's country to seller's account.

(**Prof. Sukumar Mishra**)
Deptt. of Electrical Engg.
IIT, Delhi