

# PowerWorkshop

## Professional PCI Express

PCI express comes in many FPGA based products. The XILINX FPGA offers ideal platform for the diverse applications. Particularly effective PCI Express (PCIe) solutions can be realized with virtex platform, one or more embedded cores can also be realized with this platform. This course is aimed for hardware designers (implementation), software designers (API, GUI, software driver development) and also for system architects (XILINX PCIe solution and performance, Latency, Bandwidth...).

The 5-days workshop from PLC2 “Professional PCI Express” educate the participant in details with effective application of PCIe cores. So that designer can implement XILINX PCIe solution effectively in his own design environment. This workshop dealt not only with the basic protocol application possibilities but also includes the explanation of various soft and embedded IP-cores. With other

priorities such as PCB design, simulation and test hardware all these critical aspects and there solutions will be discussed and demonstrated. Thus, this power workshop gives comprehensive knowledge for successful implementation of application with PCI Express.

### Applicable technologies

Mainly latest Virtex FPGAs, but also Spartan FPGAs

### Requirements

Basic VHDL

Basic ISE

### Duration and Cost

Duration: 5 days

Cost: € 2.900, – net per person, including detailed training material, drinks in the breaks and lunch.

## Agenda

### Introduction to PCI Express

- PCIe Basics
- Topology
- PCIe Standards: Gen1 & Gen2

### PCIe Layers

- Architecture
- Transaction Layer, Data Link Layer, Physical Layer

### PCIe User Interface

- Transaction Types
- TLP Fields
- Packet Routing
- TLP Requests and Completion Packets
- Local Link Interface

### PCIe Initialization and Configuration

- Configuration Mechanisms
- Configuration Registers
- Configuration Capabilities

### XILINX PCIe Solutions

- Soft Cores
- Embedded Cores
- Software Support

### PCIe Usage

- CoreGen Wizards
- PCIe Implementation and Simulation
- Handling Interrupts and Errors
- Handling Power Management

### PCIe Electromechanical Design

- Specification Requirements and Solutions

### Your own PCIe Hardware

- Design Constraints and Rules
- PCB Layout Planning & Routing
- Fitting Signal Integrity
- Design Validation and Measurement Techniques

### PCIe Design Example

- Application Example

### Labs

- Multiple Labs on
- Exploring the PCIe Protocol
- Generation of PCIe Cores
- Simulating PCIe Cores
- Application of PCIe Solutions