

# quad V7 Prototyping System



## Product Summary

The proFPGA quad V7 system is a complete, scalable, and modular multi FPGA solution, which fulfills highest needs in the area of FPGA based Prototyping. It addresses customers who need an scalable and most flexible high performance ASIC Prototyping solution for early software development and real time system verification.

The innovative system concept and technologies offer highest flexibility and reuseability for several projects, which guarantees the best return on invest.

## Highest Flexibility

The system architecture is based on an modular and scalable system concept. The FPGAs are assembled on dedicated FPGA modules, which will be plugged on the proFPGA motherboard. This offers the highest flexibility to use for example different FPGA types in one system or to scale a system in increments of one FPGA. Besides the user has nearly 100% access to all available I/Os of the FPGA, which gives him maximum freedom regarding the FPGA interconnection structure. This way the prototyping system can be adapted the best way to meet the demands of any user design. Furthermore the system offers a total of 32 extension sites on the top and bottom site for standard proFPGA or user specific extension boards like DDR-3 memory, high performance interface, or interconnection boards.

## Maximum Performance

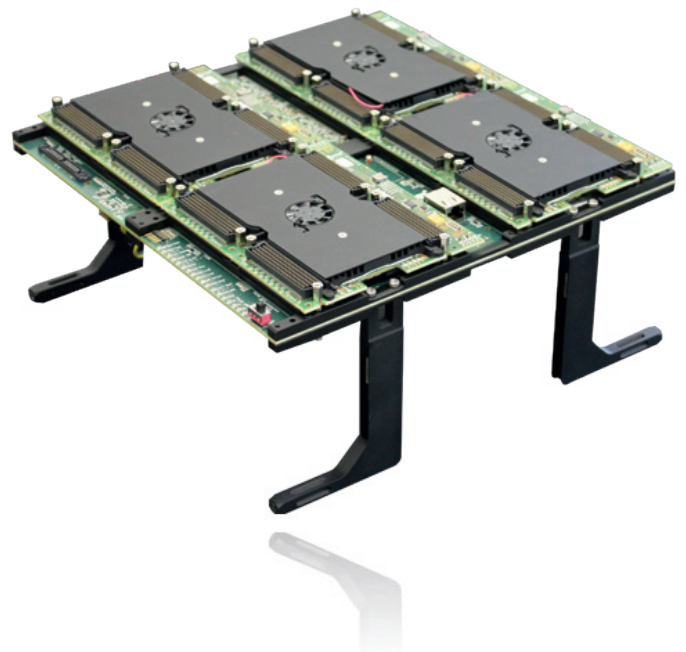
The well designed boards of the proFPGA system are optimized and trimmed to guarantee best signal integrity and to achieve highest performance. The high speed boards together with the specific high speed connectors allow an maximum point to point speed of up to 1.8 Gbps over the standard FPGA I/O and up to 12.5 Gbps over the high speed gigabit transceivers of the FPGA. This fast performance combined with the high interconnection flexibility offer the designer an maximum speed of his design running in the proFPGA system.

## Biggest Capacity

Equipped with up to 4 Xilinx Virtex 7 XCV2000T FPGA modules, the proFPGA quad system can handle up to 48 M ASIC gates alone on one board. Due to the fact, that multiple proFPGA quad or duo systems can be stacked or connected together, there is unlimited scalability and no theoretical maximum in capacity.

## Extensive User Comfort

The proFPGA prototyping system provides an extensive set of features and tools, like remote system configuration, integrated self and performance test, automatic board detection, automatic I/O voltage programming, system scan and safety mechanism, which extraordinarily simplifies the usage of the FPGA based system.



## Key Features

- ✦ 48 M ASIC gates capacity on one board
- ✦ 4336 signals for I/O and inter FPGA connection
- ✦ 64 dedicated high speed serial I/O transceivers
- ✦ 32 individually adjustable voltage regions
- ✦ Up to 1.8 Gbps/12.5 Gbps point to point speed
- ✦ proFPGA FPGA Mixing Technology (FMT)
- ✦ Smart Stacking Technology (SST)
- ✦ High performance host interface (DMBI)
- ✦ Advanced Clock Management (ACM)

## Innovative Technologies



### Smart Stacking Technology

- ❖ Board detection when boards are plugged
- ❖ Automatic and right I/O voltage setting and programming with conflict detection
- ❖ Integrated interconnection self- and performance test
- ❖ Smart I/O resource management. No I/O resources get lost or get blocked by connectors



### FPGA Mixing Technology

- ❖ Easy plugging and unplugging of FPGA modules on motherboards
- ❖ Various FPGAs from different vendors can be mixed
- ❖ Automatic scanning and detection of FPGA modules, when plugged
- ❖ Different FPGA configurations are controlled by proFPGA Messenger



### Device Message Box Interface

- ❖ High speed, low latency data exchange system
- ❖ Enables various use modes like remote system configuration and monitoring, debugging, application level programming, debugging and co-simulation
- ❖ Up to 4 Gbps data transfer rate
- ❖ Runs over USB, Ethernet or PCIe



### Advanced Clock Management

- ❖ 256 differential clock inputs
- ❖ X- local clocks
- ❖ 8 global clock and sync signals per motherboard

proFPGA quad V7 Specification	
FPGAs	- 4 x Xilinx Virtex XC7V2000T FPGA Modules
Capacity	- Up to 48 M ASIC gates on one board (12 M ASIC gates per FPGA Module)
FPGA-internal memory	- Up to 186,048 kbits on one board (46,512 kbits per FPGA Module)
Signaling rate	- Up to 1.8 Gbps (standard I/O)/ 12.5 Gbps (MGT)
Extension sites	- Up to 32 Extension sites with High Performance (up to 21 Gbps) connectors
I/O resources	- Overall 4336 signals for I/O and inter FPGA connection - 1084 free I/Os per FPGA Module - 4x148 I/Os to top side connectors - 3x148 and 1x48 I/Os to bottom side connectors - Single-ended or differential
High speed I/O transceivers	- 64 dedicated MGTs running up to 12.5 Gbps - 16 MGTs (12.5 Gbps) per FPGA Module
FPGAs interconnections	- Flexible via high-speed interconnection boards or cables
Voltage regions	- 32 individually adjustable I/O voltage regions - 8 individually adjustable voltage regions per FPGA Module - Stepless from 0.6V up 1.8V - Automated detection of daughter card and adjustment of right voltage
Clocking	- 256 differential external clock inputs - 64 differential clock inputs per FPGA Module - 8 differential clock inputs per connector - X- local clocks - 8 global clock and sync signal inputs per motherboard - X fully synchronous derived clocks with sync signals
Configuration	- With host software via Ethernet, USB 2.0 or PCIe or Xilinx JTAG interface
Data exchange	- On board DMBI (Device Message Box Interface) - Data exchange rate: - Ethernet (up to 100 Mbps) - USB - PCIe (up to 4 Gbps)
Power	External (optional) ATX Power Supply (12 V, 24 - 35 A output)
Dimensions	- 11.81" x 0.95" x 12.20" / 300 mm x 24 mm x 310 mm (width x height x depth) - 2.5 kg weight

### proFPGA quad V7 I/O and Clock Architecture

