

# Single VU440 Prodigy™ Logic System

The Single VU440 Prodigy Logic System is a compact, sleek, all-in-one system that includes all components - FPGA module, extendable power control module, and power supply for maximum flexibility, durability, and portability. The system is based on Xilinx's Virtex UltraScale XCVU440 FPGA and provides 1,184 general purpose I/Os and 44 GTH transceivers on 10 high-speed connectors. Utilizing the 6<sup>th</sup> generation Prodigy Player Pro™ technology, user can perform an array of runtime features remotely through both Ethernet and USB. User also have access to S2C's vast library of over 80 daughter cards to quickly build prototyping targets. The modular system can be extended and upgraded into a Dual or Quad system.

## Highlights

- Large capacity and scalability with 5.54M system logic cells and 88.6Mb internal memory with ability to connect multipleboards together for even greater capacity
- 1,152 high-performance I/Os through 8 Prodigy connectors that support a variety of daughter cards
- 44 high-speed transceivers that can run up to 12.5Gbps
- Compact, sleek, all-in-one chassis for clean, portable, and well-organized work environment
- Abundant add-on remote management capability



## Features

### Large Capacity & Scalability

- 5.54M system logic cells and 331.8Mb internal memory
- On-board DDR4 SO-DIMM socket supports up to 8GB memory
- Modular design can be extended and upgraded into a Dual or Quad system
- Multiple Logic Systems can be conveniently connected together to expand capacity

### High Performance

- Up to 100W power for each FPGA
- Equal trace length for I/Os from same I/O connector
- On-board support of DDR4 memory can run up to 2,400 Mbps

### High Reliability

- Screw-lock design to high-speed I/O connectors
- Self-Tests - Isolate design issues from board issues conveniently with a software GUI
- Monitoring of on-board voltage, current, and temperature with a software GUI
- Automatic shut-down upon detection of overcurrent, overvoltage, or overtemperatures

### Flexible & Powerful I/Os

- 1,152 I/O pins through 8 Prodigy connectors
- I/O voltage can be adjusted to 1.2V, 1.35V, 1.5V or 1.8V through RunTime software in GUI with 4 status LEDs on-board to indicate I/O voltage
- 16 gigabit transceivers and 32 GPIOs through 2 PGT I/O connectors

## Features

### Advanced Clock Management Standalone Mode

- 6 global clocks to be selected from
  - 6 programmable clock sources (0.2 ~ 350MHz)
  - 5 pairs of external clocks through MMCX connectors
  - 1 OSC socket
- 3 design clock outputs through 3 pairs of MMCX connectors
- 2 dedicated fast clocks when using pin-multiplexing through Prodigy Player Pro
  - One is fixed to 200MHz
  - The other one is adjustable (0.2 ~ 350MHz)
- 2 global resets sourced from pushbutton or MMCX
- 1 global reset sourced from RunTime software in GUI

### Multi-System Mode

- 6 global clocks to be selected from
  - 6 local programmable clock sources (0.2 ~ 350MHz)
  - 6 global clock sources
- 3 feedback clocks can be output to global clock sources
- 2 global resets sourced from global reset sources

### Ease-of-Use

- Multiple FPGA configuration options through Ethernet port, USB port, JTAG, and Micro SD card
- Remote power on/off/recycle through Ethernet
- Auto detection of daughter cards and cables
- Virtual SWs & LEDs for simple tasks such as changing a setting or indicating a condition remotely
- Virtual UART for firmware debugging
- User Test Area - LEDs, pushbuttons, switches, and pin headers for testing and debugging
- On-board battery charging circuit makes FPGA bin file encryption easy
- Optional ProtoBridge™ AXI software to co-model with software/simulation models at transaction-level
- Optional Prodigy Multi-Debug Module (MDM) for the concurrent deep trace debugging of multiple FPGAs
- Compatible with S2C's off-the-shelf pre-tested daughter cards

## I/O Architecture

