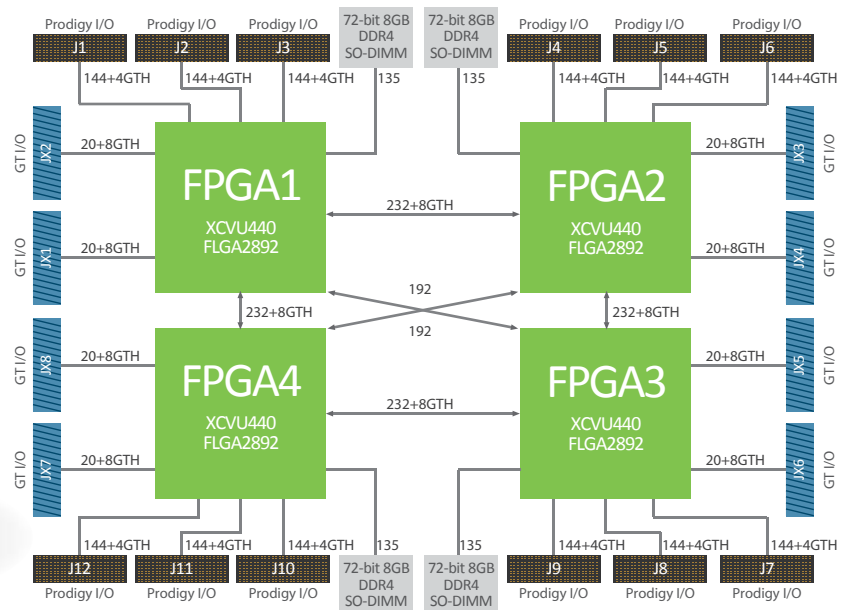


# Quad VU440 Prodigy™ Logic Module

The Quad VU440 Prodigy Logic Module is the 6th generation SoC/ASIC prototyping system based on Xilinx's Virtex UltraScale XCVU440 FPGA. The system has 1,888 general purpose I/Os and 112 GTH transceivers on 20 high-speed connectors, and users have access to S2C's 80+ daughter cards to quickly build prototype targets. In addition, users can perform an array of runtime features remotely through both Ethernet and USB. Up to 8 Quad VU Logic Modules can be configured in a Cloud Cube™ to support a large-scale SoC/ASIC and to be shared among multiple users.

## Highlights

- 232 interconnections ease design partitioning without cables or interconnect boards
- 1,888 general purpose I/Os, 112 GTH transceivers on 20 high-speed connectors
- On-board support for four 72-bit 8GB ECC DDR4 SO-DIMM sockets
- Compatible with 80+ Prodigy Daughter Card Library
- Abundant add-on features



Quad VU440 Prodigy Logic Module Architecture

## Features

### Large Capacity & Scalable

- 22.16M System Logic Cells and 354.4 Mb of internal memory
- Four on-board DDR4 SO-DIMM sockets can hold at least 72-bit 8GB DDR4 memory in each socket
- Multiple Logic Modules can be conveniently connected together to expand capacity through interconnection modules or cables
- Up to 8 Quad VU Prodigy Logic Modules can be configured in a Prodigy Cloud Cube

### High Reliability

- Screw-lock design to 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 over-current, over-voltage or over-temperature

### Advanced Clock Management

#### Standalone Mode

- 6 global clocks to be selected from
  - 6 programmable clock sources (0.2-700MHz)
  - 6 internally generated clocks from any of the four FPGAs
  - 5 pairs of external clocks through MMCX connectors
  - 1 OSC socket
- 3 design clock outputs
  - through 3 pairs of MMCX connectors

#### Cloud Cube Mode

- 6 global clocks to be selected from
  - 6 local programmable clock sources (0.2-700MHz)
  - 6 Cloud Cube global clock resources
- 3 feedback clocks
  - Internally generated clocks can be output to Cloud Cube global clock sources

## Features

### Flexible & Powerful I/Os

- 1,728 general purpose I/O pins and 48 GTH transceivers on 8 Prodigy Connectors
- Prodigy Connector I/O voltage on 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
- 64 GTH transceivers and 160 general purpose I/O pins for control signals on 8 GT connectors

### LVDS Pin-Multiplexing Interconnection Support

- 232 physical interconnections and 8 gigabit transceivers to the horizontally and vertically adjacent FPGA optimized for pin-multiplexing using LVDS
- 192 physical interconnections to the diagonal FPGA optimized for pin-multiplexing using LVDS
- Support for 10000+ design interconnections between each two FPGAs
- Optional Prodigy Player Pro Compile Software for automatic design partitioning and LVDS pin-multiplexing insertion

### High Performance

- Up to 100W of power for each FPGA
- Equal trace length for I/Os from same I/O connector
- On-board support of high-speed DDR4 memory

### Ease-of-Use

- Auto detection of daughter cards or cables
- On-board battery charging circuit makes FPGA bin file encryption easy
- Compatible with S2C's off-the-shelf pre-tested daughter boards
- Multiple FPGA configuration options through Ethernet port, USB port, JTAG and micro SD card
- Virtual SWs & LEDs for simple tasks such as changing a setting or indicating a condition remotely
- Optional S2C design implementation software
- Optional S2C Prodigy Debug Module for multi-FPGA deep-trace debug through gigabit transceivers
- Optional ProtoBridge™ AXI software to co-model with software/simulation models in transaction-level

