

# Prodigy™ S7-13P Logic System

The Prodigy S7-13P Logic System is a high-performance, compact, all-in-one prototyping system that includes all components - FPGA module, power control module, and power supply - for maximum flexibility, durability, and portability. The system is based on Xilinx's Virtex UltraScale+ VU13P FPGA and provides 676 general purpose I/Os and 48 GTY transceivers on 11 high-speed connectors. Utilizing the 7th generation Prodigy Player Pro™ technology, user can perform an array of runtime features remotely through both Ethernet and USB. User also has access to S2C's vast library of over 90 daughter cards to quickly build prototyping targets.

## Highlights

- Supports 25Gbps transceivers
- 3.78M System Logic Cells, 455 Mb of internal memory, and 12,288 DSP Slices
- 676 high-performance I/Os
- 4x QSFP28 optical interfaces, each supporting 100G applications
- Supports MIPI and x8 PCIe Gen3
- Abundant remote management capability



## Features

### Large Capacity & Scalability

- 3.78M System Logic Cells
- 455Mb internal memory
- 12,288 DSP slices
- Multiple Logic Systems can be conveniently connected to expand capacity

### 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 over-current, over-voltage, or over-temperatures

### High Performance

- Equal trace length for all the Prodigy I/O connectors
- Up to 100W of power for an FPGA

### Flexible & Powerful I/Os

- 576 I/Os and 15 GTY transceivers through 4 Prodigy I/O connectors
- 16 GTY transceivers and 32 GPIOs through 2 PGT I/O connectors
- 16 GTY transceivers through 4 QSFP28 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

## Features

### Advanced Clock Management Standalone Mode

- 6 global clocks to be selected from
  - 6 programmable clock sources (0.16 ~ 350MHz)
  - 5 pairs of external clocks through MMCX connectors
  - 1 OSC socket
- 3 design clock outputs through 3 pairs of MMCX connectors
- 1 dedicated clock, reference clock, and reset for pin-multiplexing
- 2 global resets sourced from push button 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 (0.16 ~ 350MHz)
  - 6 global clock sources
- 3 feedback clocks can be output to global clock sources
- 2 global resets sourced from global reset sources
- 1 dedicated clock, reference clock, and reset for pin-multiplexing

### 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 Switches & LEDs for simple tasks such as changing a setting or indicating a condition remotely
- Virtual UART for firmware debugging
- User Test Area - LEDs, Push Buttons, Switches, and Pin Headers for testing and debugging
- Optional 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

