

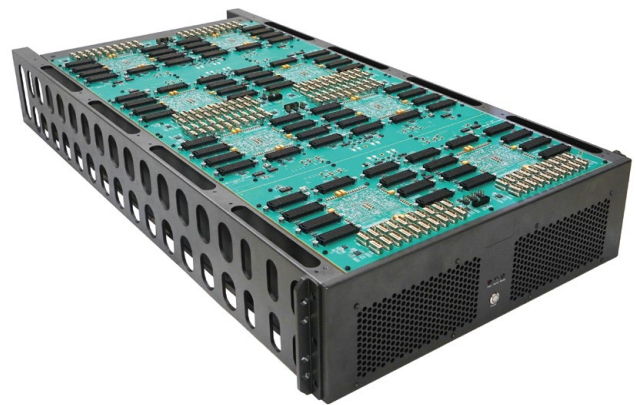
# Prodigy LX2 Enterprise Prototyping System

## High-performance full system validation and software development solution

The Prodigy LX2 Enterprise Prototyping System provides industry-leading performance and capacity. It integrates the scalable prototyping hardware, with Player Pro Runtime, a runtime control software, to meet the verification requirements for a wide range of applications. Prodigy LX2 is part of S2C's Prodigy Complete Prototyping Solution which consist of Player Pro Compile Time, an automatic prototyping compile tool; Player Pro Debug Time, a deep trace debugging tool; ProtoBridge AXI, an FPGA-assisted verification tool; and Neuro, a cloud-based management tool, plus a rich portfolio of Prototype Ready IP - all designed to accelerate the prototyping process.

### Highlights

- Industry leading capacity, supports nearly 400M ASIC gates per LX2
- Flexible topology structure and multi-level interconnection capability, increases prototype performance
- Modular design to ease deployment, expansion and maintenance
- Rich validation tool supports to shorten prototype setup time
- Enterprise-based management & control tool to manage prototyping systems, users and projects
- Application Scenarios: Early Software Development, Full system validation and Regression Test



### Features

The LX2, S2C's new generation of Logic Matrix uses an advanced structure of "Logic Matrix → Rack → Cluster" which can expand to billions of ASIC gates. The LX2 can meet the most demanding prototyping requirements in a wide variety of applications including 5G, AI, ML and GPU.

#### Large Capacity and Scalability

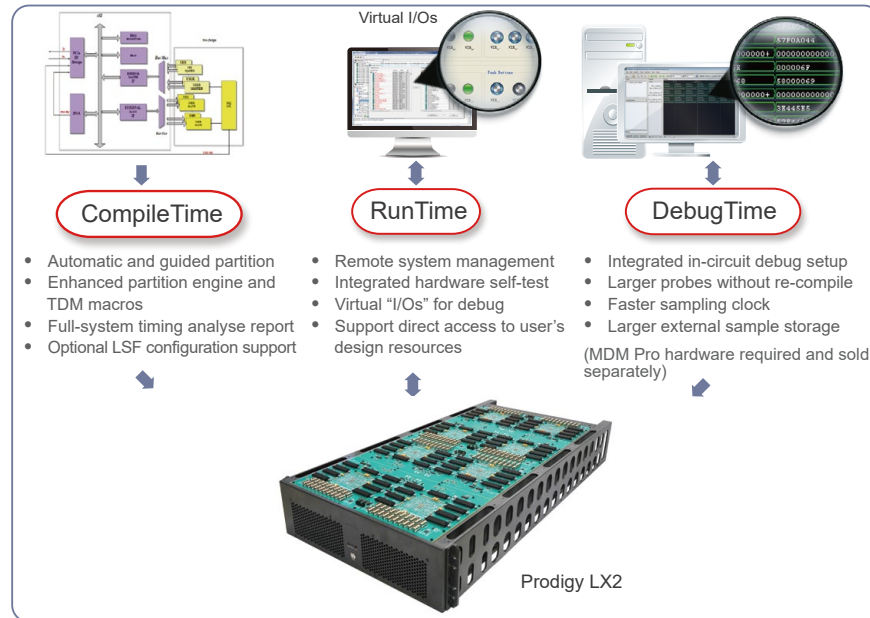
- The LX2 is equipped with 8 Xilinx Virtex UltraScale+ VU19P FPGA, and supports up to:
  - 71.5M System Logic Cells
  - 1,327.2Mb Internal Memory
  - 30,720 DSP Slice
- Scales to large setups, 8 LX2 in a standard 42U rack, up to 64 VU19P FPGAs
- Multi-racks can be cascaded to achieve even larger capacities

#### High Reliability

- High-speed I/O connectors with secure screw-lock design; hardware self-test, and real-time monitoring system
- Redundant power supply design allows switching supplies without interruption
- High-efficiency heatsink and cooling fan with PWM functions

#### Flexible topology structure and multi-level interconnection capability

- Advanced Clock Management
  - Each Logic Matrix supports 12 global clock inputs, 3 global clock outputs and 4 global resets
  - Dedicated global clocks and resets control module, synchronizes the clocks and resets in the server rack or across the server racks
- Rich interconnection resources in LX2
  - 11,648 GPIO and 640 GTY transceivers
  - Each GTY transceiver can run up to 28Gbps
- Fast system deployment capabilities
  - Prodigy cables and MCIO cables
  - High performance interconnection boards
  - Simplify the deployment in the server rack or across the server racks



### PPro-CT - Automatic Prototyping Compile Tool

Player Pro CompileTime provides an easy-to-use integrated GUI environment and Tcl interface which makes it easy to take an existing design, compile it, partition it into multiple-FPGAs, place & route and generate the individual bin files.

- Full-automatic or user-guided design partition into FPGA logic matrix
- Multiple TDM mode support including SSTL, LVDS and SerDes
- Automatic signal pre-qualification and TDM logic insertion to achieve better performance
- System timing report facilitates quickly analyzing and optimizing system performance
- Supports bus identification partition to achieve optimal high-speed prototyping

### PPro-DT - Deep Trace Debugging Tool

The capability of system debugging and troubleshooting directly affects the project progress. Player Pro DebugTime supports concurrent debugging of multiple FPGAs with no need to consume FPGA internal memory.

- Supports two modes including compile and IP modes
- Trace up to 128K probes in 8 groups of 16K probes each
- Sampling frequency at speeds up to 125MHz
- Store up to 64GB of waveform data externally
- Sampling data supports various standard formats for debug and analysis

### PPro-RT - Remote Management Tool

Player Pro RunTime provides an integrated GUI environment and Tcl interface that helps users remotely monitor and control their prototyping systems through Ethernet or USB port.

#### Remote Control through USB or Ethernet

- Automatic detection of cables and daughter cards when plugged in
- Easy setting or monitoring I/O voltage and fan speed
- Remotely open, shut down or reboot the prototyping system

#### Concise GUI makes the configuration easier

- Download the design to FPGAs through USB or Ethernet
- Supports reading or writing the design to an SD card, and download it from an SD card
- Supports multiple programmable clocks and I/O voltage settings

#### Powerful Debugging features, easy interacting with DUT

- Virtual I/Os to configure or detect the design status
- Virtual UARTs for firmware debugging
- NT bus for direct access to user design resources

## ProtoBridge AXI - FPGA Assistant Tool

ProtoBridge AXI provides a high throughput channel between the host PC and DUT through PCIe interface. It delivers:

- AXI-4 bus protocol between host PC and FPGA
- 8-lane PCIe Gen3 as the physical transmission channel
- Rich coverage of C-API function calls
- Massive data transfer from host PC to FPGA up to 4,000MB/s

The ProtoBridge AXI package includes hardware logic IP, plus drivers and APIs. It supports data transfer through the LX2 system, and offers an easy solution for software and hardware co-verification applications.

## Neuro - Cloud Management Tool

Neuro is designed for deploying prototyping systems as a shared IT resource. It can manage and monitor global resources as a data center which can dramatically extend the run time of prototyping systems, lower deployment costs and minimize the impact of space or physical limitations. It supports:

- Coordinate the management of multiple users/projects to avoid resource conflicts
- Monitor maximum system uptime to estimate system availability
- Manage users work order submissions for quick deployment and delivery
- Manage reports and incident recording to make the complete process traceable

## Prototype Ready IP

S2C offers a rich portfolio of daughter boards to help quickly implement your prototyping targets including MIPI, PCIe, HDMI, USB, DDR4/DDR3, QSFP+, and more. These have been used to address a broad range of applications including artificial intelligence, high-performance computing, digital signal processing, graph processing, data storage, IoT, data communications, medical devices, automotive electronics, and other market segments. S2C also provides a series of reference designs to accelerate integration and validation of complex systems, saving both prototyping costs and resources.

## Configuration Table

	LX2-M1	LX2-M2	LX2-P3	LX2-P4
FPGA Numbers	2	4	6	8
System Logic Cell (M)	17,876	35,752	53,628	71,504
Equivalence ASIC Gate (M)	98	196	294	392
FPGA Internal Memory (Mb)	331.8	663.6	995.4	1327.2
DSP Slices	7,680	15,360	23,040	30,720
User I/O	2,912	5,824	8,736	11,648
High-speed Transceiver	160	320	480	640
Prodigy Connector <sup>1</sup>	18	36	54	72
MCIO Connector <sup>2</sup>	40	80	120	160

<sup>1</sup> Each Prodigy Connector provides 144 single-ended/72 LVDS pairs

<sup>2</sup> Each MCIO Connector provides 4 GTY transceivers and 8 GPIOs