

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 time 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 consists of Player Pro - CompileTime, an automatic prototyping compile tool; Player Pro - DebugTime, 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 is currently fulfilling the most demanding prototyping requirements in a wide variety of applications including 5G, AI, ML and GPU.

Large Capacity and Scalability

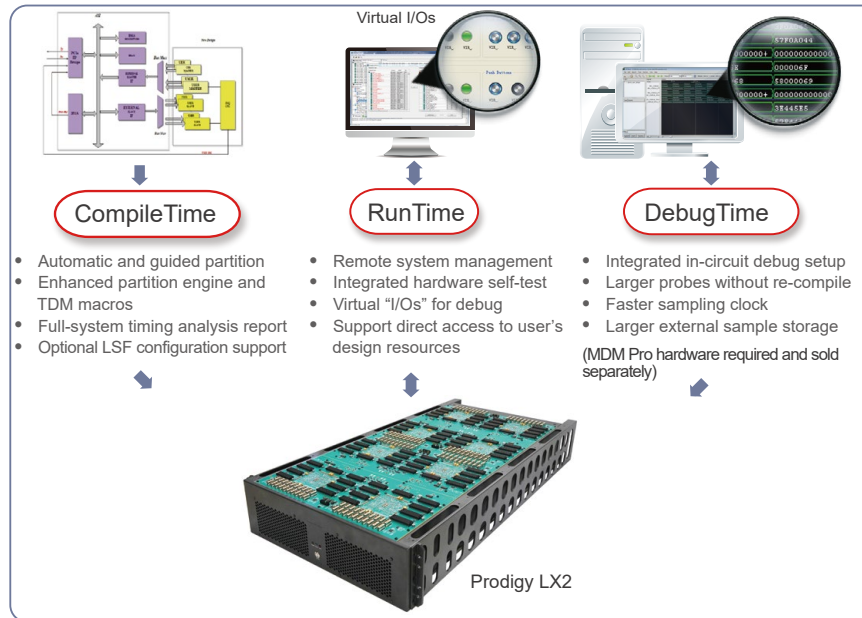
- The LX2 is equipped with 8 Xilinx Virtex UltraScale+ VU19P FPGAs, and supports up to:
 - 71.5M System Logic Cells
 - 1,327.2Mb Internal Memory
 - 30,720 DSP Slice
- Scales to large setups, 8 LX2 in a standard 42U rack, up to 64 VU19P FPGAs
- Multi-racks can be cascaded to achieve even larger capacities

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 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



Player Pro-CT - Automatic Prototyping Compile Tool

Player Pro Compile Time 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

Player Pro-DT - Deep Trace Debugging Tool

The capability of system debugging and troubleshooting directly affects the project progress. Player Pro-DT 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

Player Pro-RT - Remote Management Tool

Player Pro-RT 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
- Easily 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 Count	2	4	6	8
System Logic Cell (K)	17,876	35,752	53,628	71,504
Estimated ASIC Gate (M)	98	196	294	392
FPGA Memory (Mb)	331.8	663.6	995.4	1327.2
DSP Slices	7,680	15,360	23,040	30,720
User I/Os	2,912	5,824	8,736	11,648
Prodigy Connectors	18	36	54	72
MCIO Connectors	40	80	120	160