

# S7-10MQ Prodigy™ Logic System

The S7-10MQ Prodigy™ Logic System is a complete and modular multi-FPGA prototyping platform based on Intel's Stratix 10 GX 10M FPGA. The system has 4,736 general purpose I/Os and 160 high-speed transceivers on 40 high performance connectors. The Prodigy™ S7-10MQ Logic System is well suited for next generation 5G, AI, Networking and system validation of complex SoC designs.

S2C's Prodigy Player Pro™ Software technology streamlines the design compilation and enables users to perform an array of runtime features remotely through both USB and Ethernet port. Users also have access to a rich portfolio of Prototype Ready IP in the form of plug-play daughter cards to quickly build prototyping targets.

## Highlights

- Large capacity and scalability with 40.8M logic elements, 1,012Mb memory and 13,824 DSP blocks
- 4,608 high-performance I/Os for inter-FPGA connections and daughter cards
- 160 high-speed transceivers that can run up to 16Gbps
- Compatible with 90+ Prodigy Daughter Card Library
- Compact, sleek, all-in-one chassis for clean, portable, and well-organized work environment



## Features

### Large Capacity & Scalability

- 40.8M logic elements
- 1,012Mb M20K memory
- 13,824 DSP blocks (27,648 18x19 multipliers)
- 8 on-board DDR4 SO-DIMM sockets, each supports up to 72-bit 16GB DDR4
- Multiple systems can be conveniently connected to prototype even larger designs

### 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

- 4,608 high-performance I/O pins and 96 high-speed transceivers through 32 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
- 64 high-speed transceivers and 128 GPIOs through 8 PGT Connectors

### High Performance

- Up to 180W power for each FPGA
- Equal trace length for I/Os from same I/O connector
- 160 high-speed transceivers can run up to 16Gbps

## Features

### Advanced Clock Management

#### Single-System Mode

- 8 global clocks to be selected from
  - 8 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
- 3 global resets to be selected from
  - 3 from on-board push buttons
  - 2 from Clock Module Type D
  - 2 from RunTime software in GUI

#### Multi-System Mode

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

### Ease-of-Use

- Auto partitioning the design to multiple dies and multiple FPGAs with Prodigy Player Pro Compile
- 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
- User Test Area – LEDs, pushbuttons, switches and pin headers for testing and debugging
- Compatible with S2C's off-the-shelf pre-tested daughter boards
- Optional ProtoBridge™ AXI software providing a high-throughput data channel of up to 4GB/s
- Optional Prodigy Multi-Debug Module (MDM) for deep trace debugging of multiple FPGAs

## I/O Architecture

