RINCON
RESEARCH
EMPLOYEE OWNED

ROADRUNNER

ROADRUNNER
FPGA ACCELERATOR CARD WITH RRC WEB API

- PCI Express Gen 3 x8 interface
- Embedded webserver for command/control
- Two QSFP+ sockets for 40 Gbit Ethernet
- Two DDR3 8 GB SODIMMs
- Xilinx Kintex UltraScale XCKU060-1-FFVA1156 FPGA
- 1 Gbit configuration flash supports x16 BPI mode for rapid boot
- U.FL input for 10 MHz reference or trigger (1 PPS) with signal conditioning
- MAC EEPROM: 256 Kb with I2 C interface
- JTAG header
- Cooling fan control

THE ROADRUNNER is a low profile PCI Express add-in card featuring a high performance Xilinx FPGA, two Ethernet ports capable of speeds up to 40 Gbit/sec each, and an embedded webserver for command/control. It is suitable for low-cost applications where a quick development cycle is desired.
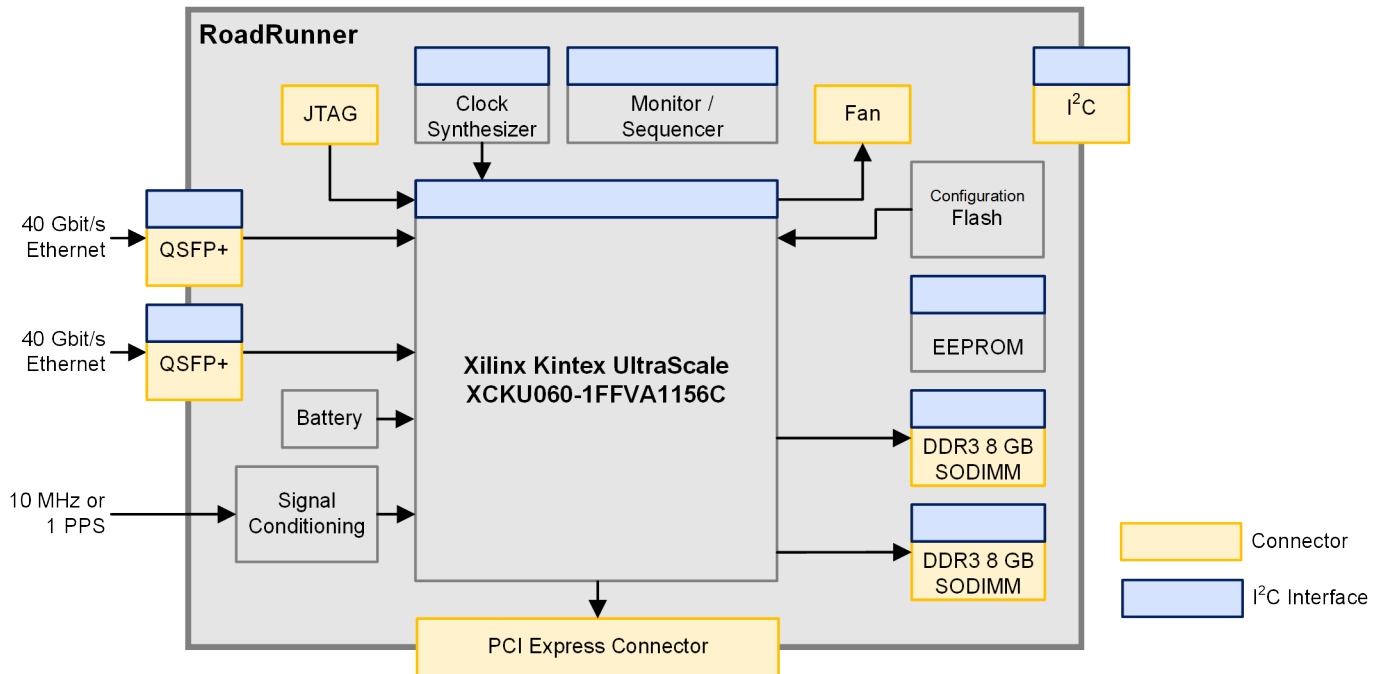
THE ROADRUNNER IS PCIE POWERED, so no additional power source is required. There is a battery for bitstream decryption keys and a switch for bitstream revision selection. The board's size conforms to the PCI low-profile, add-in card, form factor specification.

FOR QUICK AND EASY APPLICATION UPDATES, the RoadRunner is reconfigurable through PCIe. It features a programmable clock synthesizer and power monitoring fully controllable through an I^2C bus.

APPLICATION DEVELOPMENT

- Full board support package for fast and easy application development that includes:
  - DMA controller
  - I^2C interface controller
  - DDR3 memory controller
  - Embedded webserver for command/control
- SDAccel development
- OpenCL compatible
- Drivers and API for Linux host systems provided

BLOCK DIAGRAM

SPECIFICATIONS

PROCESSING
- FPGA: Xilinx Kintex UltraScale XCKU060-1FFVA1156C
  - 2,760 DSP slices
  - FPGA Memory: Block RAM 38 Mbit
  - Storage: 1 Gbit configuration flash supports x16 BPI mode
- Memory: Two DDR3 8 GB SODIMMs

INPUT/OUTPUT
- Ethernet: Two QSFP+ sockets for 40 Gbit Ethernet or 4 x 10 Gbit Ethernet, each
- EEPROM: 256 Kbit with I^{2}C interface
- LEDs: Two, tricolor, programmable
- Clocks: Programmable clocks through I^{2}C interface
- Timing Signals: U.FL input with signal conditioning for 10 MHz reference or trigger (1 PPS)
- External Ref.: 0.2 Vpp to 10 Vpp, -10 dBm to +24 dBm, AC-coupled, 10 MHz only
- 1 PPS: 50 Ω standard, Hi-Z ordering option

PHYSICAL
- Dimensions: Conforms to the PCI Low-Profile Add-in Card for factor specification
  - Dual-slot profile required for fan shroud
- Power: PCI Express
- Ambient Operating Temperature: 0° C to 40° C

DEVELOPMENT
- Controllers: DMA, I^{2}C interface, DDR3 memory, embedded webserver for command/control
- Development Interface: Reset, JTAG

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