Company & Product Summary

# ZEM5310

## FPGA Development Module & Integration Module

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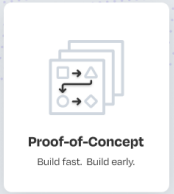
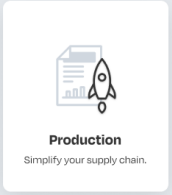
Opal Kelly

- Founded 2004.
- Leading producer of powerful FPGA modules for high-performance data acquisition, instrumentation, and test & measurement
- Focus on lifecycle-managed modules for prototypes, proof-of-concept, and production use
- Modules include the FrontPanel SDK — a multi-platform, multi-language, FPGA-agnostic framework for professional-grade hardware / software connectivity
- Introduced SYZYGY connectivity standard in 2017
- ISO 9001:2015 QMS, certified 2019





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Over 200 Universities worldwide

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Microsoft · Massachusetts Institute of Technology · Samsung · Microchip · maxim integrated

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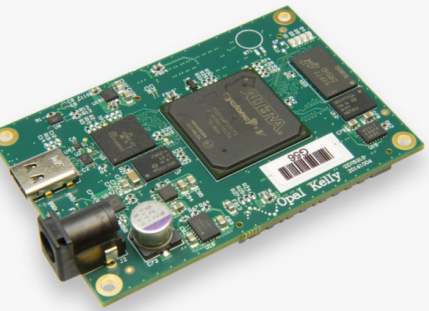
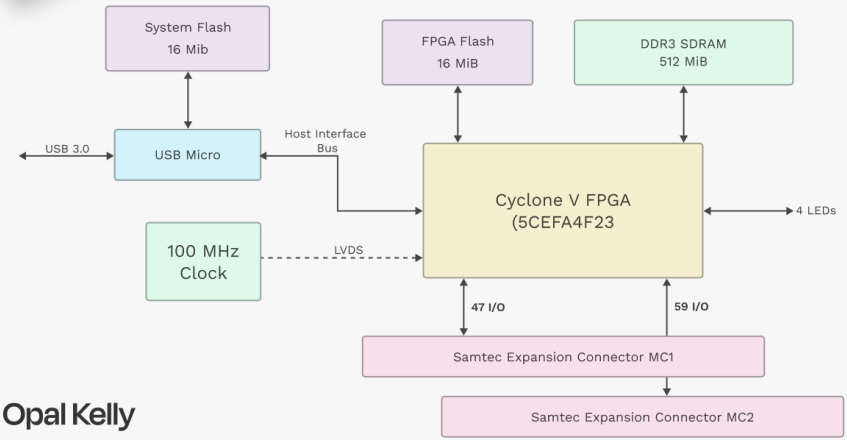
# ZEM5310



## Intel Cyclone V 5CEFA4

SuperSpeed USB 3.0 interface
512 MiB DDR3 memory
106 I/O including 2 CLKOUT and 2 CLKIN
Samtec 0.5mm board-to-board connectors

FrontPanel® SDK




| | |
|---|---|
| **Host Interface** | USB 3.0 Type C, SuperSpeed<br>FrontPanel Support |
| **FPGA** | 5CEFA4F23C7N |
| **Memory** | 512 MiByte DDR3, 32-bit wide data interface |
| **NV Memory** | 16 MiB System Flash<br>16 MiB FPGA Flash |
| **Oscillator** | 100 MHZ |
| **FPGA I/O Voltage** | Up to +3.3V |

| | MINIMUM | TYPICAL | MAXIMUM | UNITS |
|---|---|---|---|---|
| DC Input | +4.5 | +5.0 | +5.5 | VDC |
| DC Input Ripple | - | - | 50 | mVp-p |
| Operating Temperature | 0 | - | +70 | ºC |
| Storage Temperature | -50 | - | +100 | ºC |
| Weight | | 28 | | grams |
| Oscillator Frequency | | 200 | | MHz |
| Oscillator Freq. Stability | | ± 50 | | ppm |
| Oscillator Jitter | | 2.5 | | ps RMS |

| FEATURE | ZEM5310-A4 |
|---|---|
| FPGA | 5CEFA4F23C7N |
| Logic Elements (LE) | 49,000 |
| Registers | 73,920 |
| MLAB RAM | 303 Kib |
| M10K RAM | 3,080 Kib |
| 18x18 Multipliers | 132 |
| PLLs | 4 |

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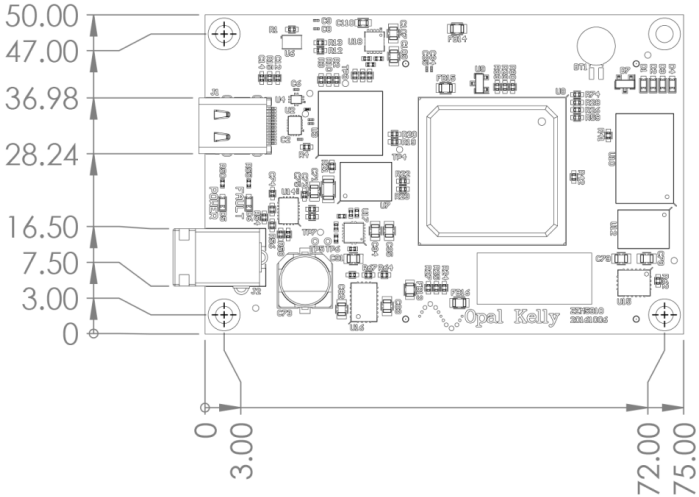
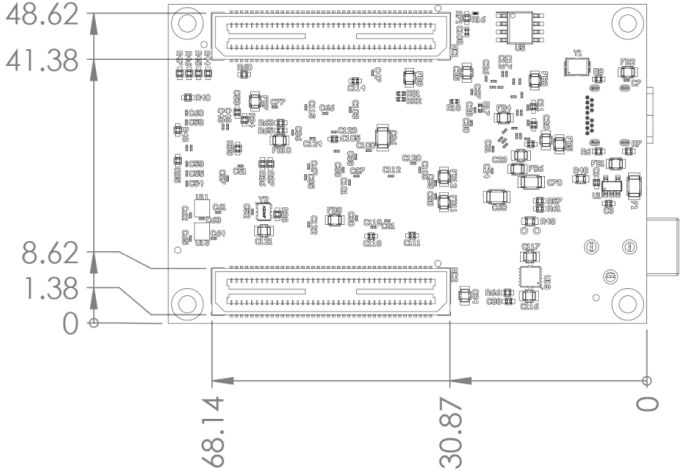
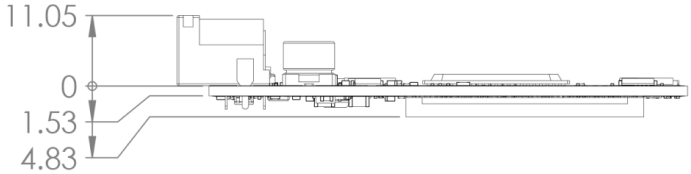
# ZEM5310

## Mechanical Drawings




All dimensions in millimeters (mm)

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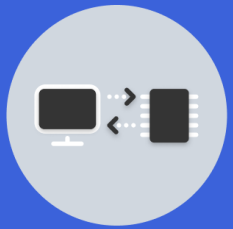
# FrontPanel® System Components



Software API and a robust driver to communicate with your device over USB, PCI Express and the internet.

Proprietary device firmware to manage FPGA configuration and communication as well as other device management and monitoring.

Lightweight FPGA IP blocks that integrate with your HDL to make host communication simple and easy.

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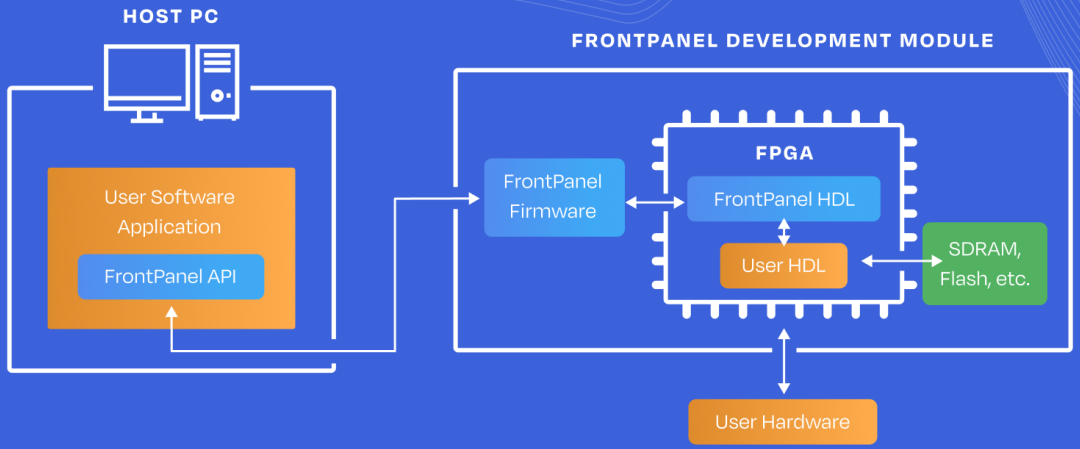
# FrontPanel® System Architecture

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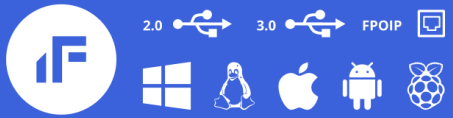
Build high-performance software-connected FPGA applications for prototypes, proof-of-concept, and production

## FrontPanel® SDK

- Multi-platform, multi-language
- Easy to use. High performance. Stable and reliable.
- USB 2.0, USB 3.0, PCI Express, and TCP/IP
- C++, C# (.NET), Python, Java, Ruby APIs
- Windows DLL / Shared Object for 3rd-party integration
  (e.g. MATLAB, LabView)

## FrontPanel® over IP (FPoIP)

- Familiar API, extended over TCP/IP networks
- Protocol, server, and client implementations
- Server for USB-based devices: Windows, Linux, and macOS hosts
- Lua-based server-side scripting for latent conditions
- Javascript implementation for in-browser operation

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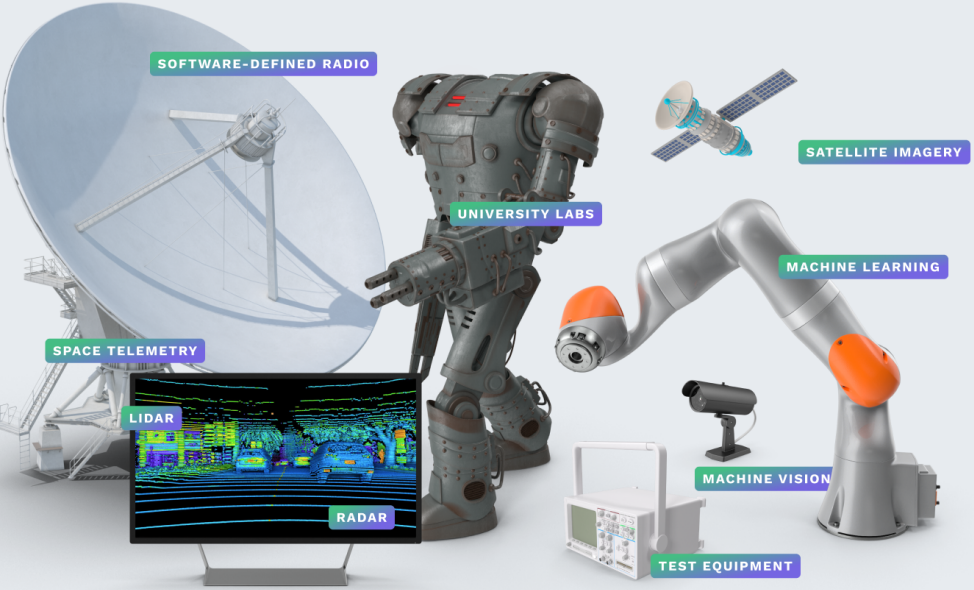
# Applications & Deployments




- Data Acquisition
- Instrumentation
- Test & Measurement
- Machine Vision
- Software-Defined Radio
- Education & Research
- Machine Learing / AI
- Networking
- RADAR, LIDAR
- Satellite Imagery
- Advanced / Remote Sensing
- Semiconductor Simulation, Test, and Debug

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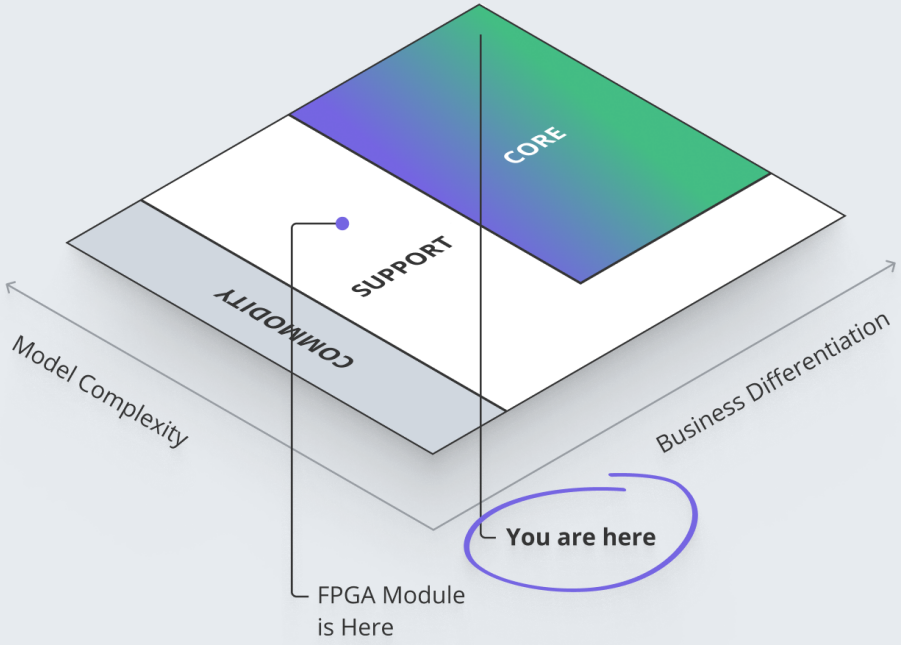
# Focus on Your Core Expertise




Reduce time to market

Build a team that strengthens your core

Simplify your supply chain

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