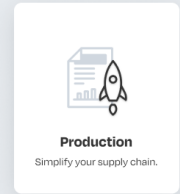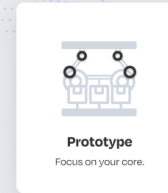# XEM8350

FPGA Development Module & Integration Module

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

Proof-of-Concept
Build fast. Build early.

Prototype
Focus on your core.

Production
Simplify your supply chain.

OUR CUSTOMERS

Over 2,000 corporate customers

Over 200 Universities worldwide

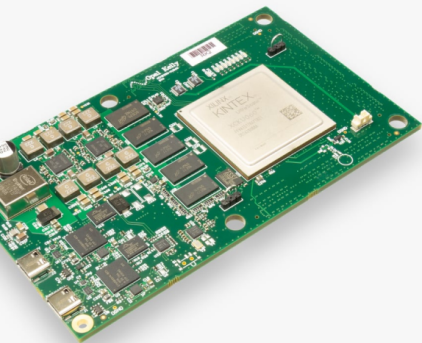**CUSTOMER SEGMENTS**

Research Organizations

National Laboratories

Military / Aerospace

Scientific Instrumentation

Commercial

TEXAS INSTRUMENTS

QUALCOMM

CIRRUS LOGIC

Sandia National Laboratories

ANALOG DEVICES

Microsoft

MIT Massachusetts Institute of Technology

SAMSUNG

MICROCHIP

maxim integrated

National Semiconductor
The Sight & Sound of Information

Agilent Technologies
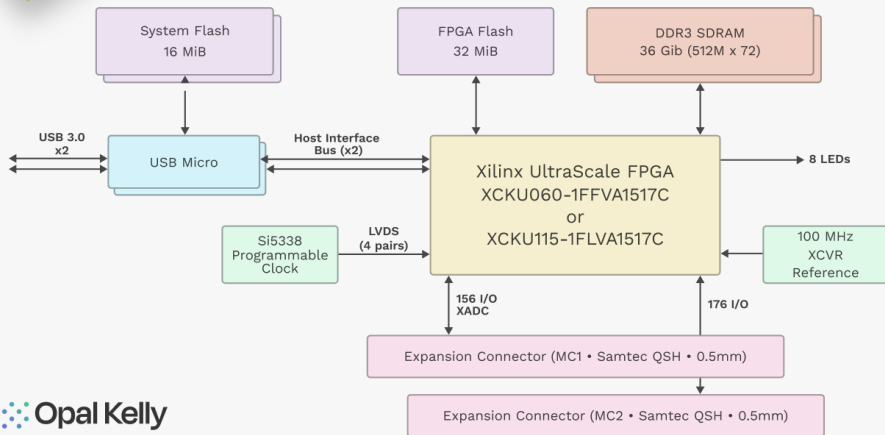Innovating the HP Way

Google

intel

XEM8350

Xilinx Kintex UltraScale XCKU060

2x SuperSpeed USB 3.0 interface
4 GiB DDR4 memory (with ECC)
332 I/O and 28 Gigabit Transceivers
Samtec 0.5mm board-to-board connectors

FrontPanel® SDK

2.0 3.0 USB FPOIP [ ] Windows Linux Apple Android Raspberry Pi

Host Interface	2x USB 3.0 Type C, SuperSpeed FrontPanel Support	
FPGA	XCKU060-1FFVA XCKU115-1FLVA (Contact sales@opalkelly.com)	
Memory	4 GiByte DDR4, 72-bit wide data interface (ECC capable)	
NV Memory	2x 16 MiB System Flash 32 MiB FPGA Flash	
Oscillator	0.16 to 350 MHz programmable	
FPGA I/O Voltage	Up to +1.8V, Software Programmable	

	MINIMUM	TYPICAL	MAXIMUM	UNITS
DC Input	+4.5	–	+16	VDC
DC Input Ripple	–	–	50	mVp-p
Operating Temperature	0	–	+70	ºC
Storage Temperature	-50	–	+100	ºC
Weight		132		grams
Oscillator Frequency	0.16	–	350	MHz
Oscillator Freq. Stability		± 50		ppm
Oscillator Period Jitter		10		ps pk-pk

FEATURE	XEM8350-KU060	XEM8350-KU115
FPGA	XCKU060-1FFVA1517C	XCKU115-1FLVA1517C
Slice Count	11,800	33,650
CLB Flip-Flops	663,360	1,326,720
Distributed RAM	9.1 Mib	18.3 Mib
Block RAM	38 Mib	75.9 Mib
DSP Slices	2,760	5,520
Clock Management Tiles	12	24

Block Diagram

- System Flash 16 MiB
- FPGA Flash 32 MiB
- DDR3 SDRAM 36 Gib (512M x 72)
- USB 3.0 x2
- USB Micro
- Host Interface Bus (x2)
- Xilinx UltraScale FPGA XCKU060-1FFVA1517C or XCKU115-1FLVA1517C
- 8 LEDs
- Si5338 Programmable Clock
- LVDS (4 pairs)
- 100 MHz XCVR Reference
- 156 I/O XADC
- 176 I/O
- Expansion Connector (MC1 • Samtec QSH • 0.5mm)
- Expansion Connector (MC2 • Samtec QSH • 0.5mm)

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XEM8350
Mechanical Drawings

2.00

2X Ø3.20

85.00
81.00
77.00
68.00

35.61
26.67

17.48
8.54
4.00
0

0.48
0
4.00

65.00

139.00
145.00

4X Ø6.35

79.00

6.00
0

82.62
75.38
73.19

11.81
9.62
2.38

142.62
135.38
132.69

71.31

0

11.04

0

2.78
6.06

3.20
0
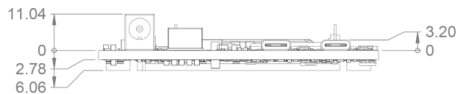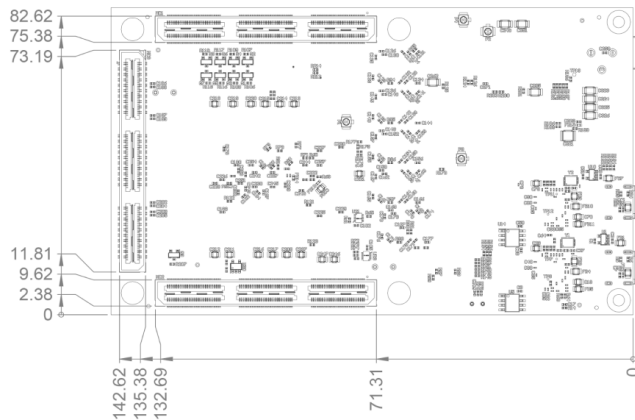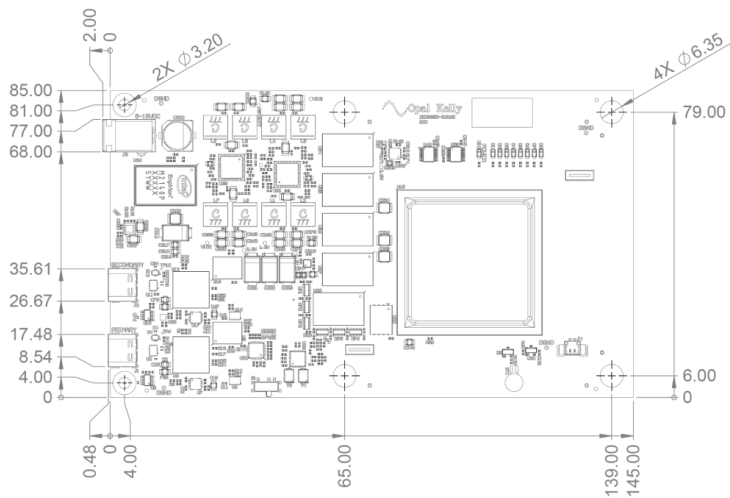
All dimensions in millimeters (mm)

••• Opal Kelly

FrontPanel ® System Components
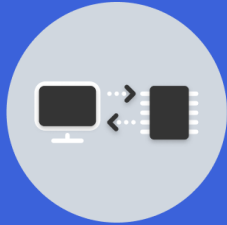
Software API and a robust driver to communicate with your device over USB, PCI Express and the internet.
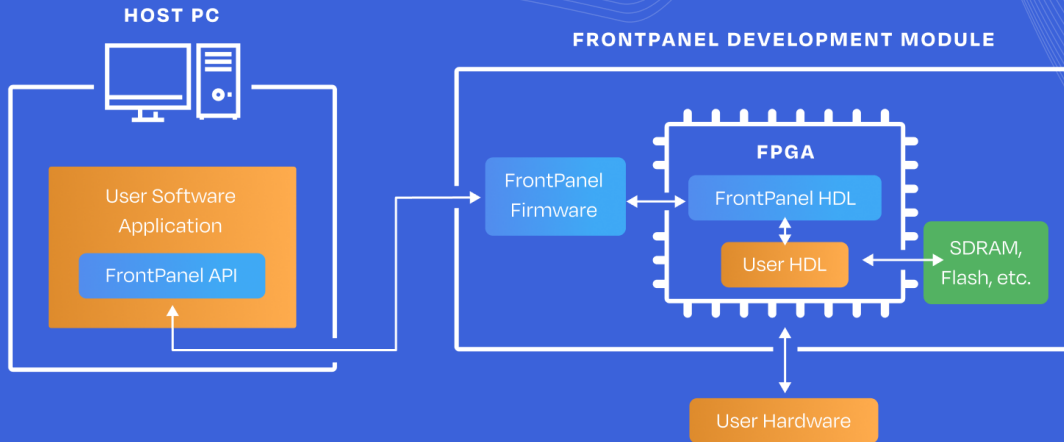
Proprietary device firmware to manage FPGA configuration and communication as well as other device management and monitoring.

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

FrontPanel ® System Architecture

HOST PC

FRONTPANEL DEVELOPMENT MODULE

User Software Application

FrontPanel API

FrontPanel Firmware

FPGA

FrontPanel HDL

User HDL

SDRAM, Flash, etc.

User Hardware

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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

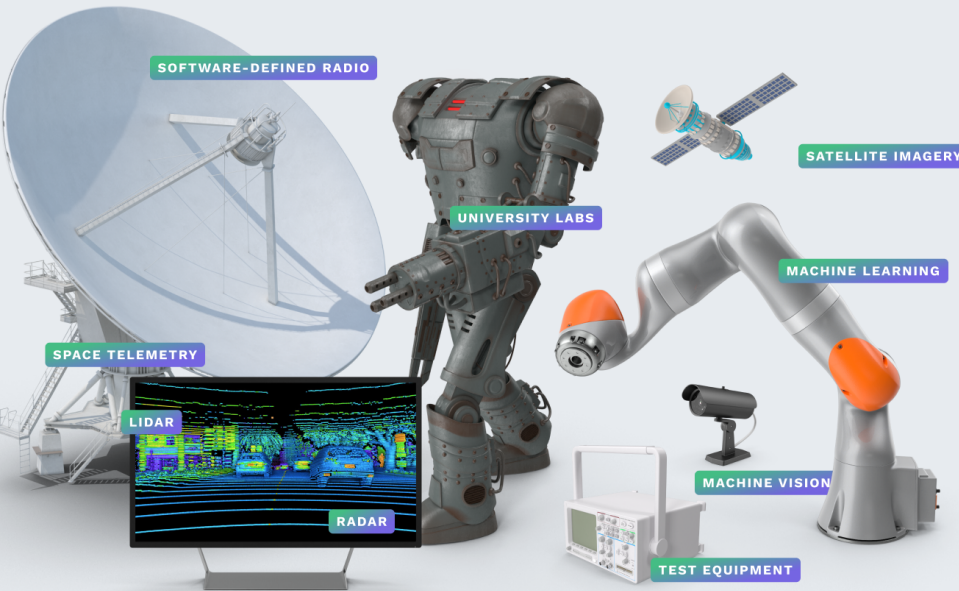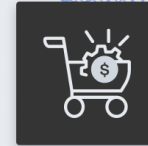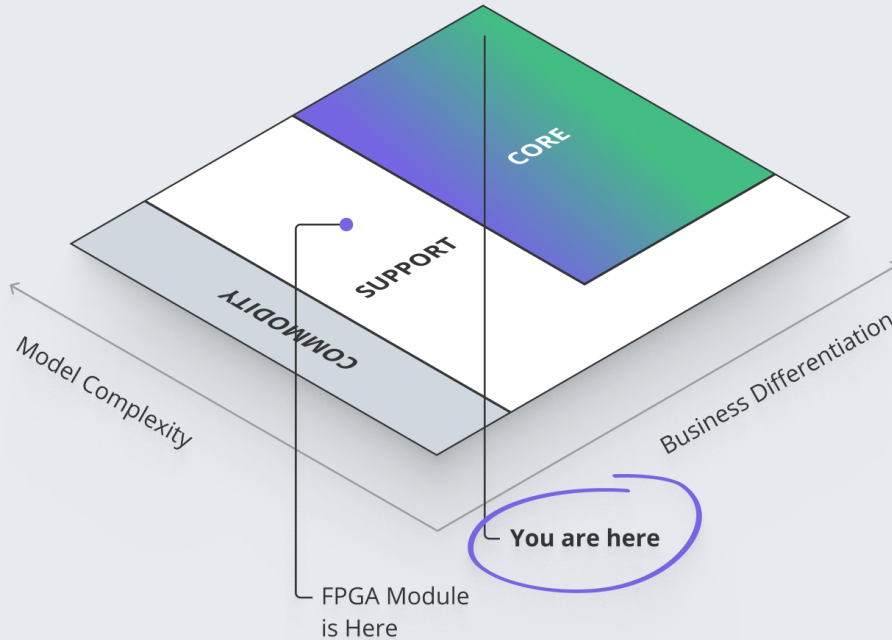- Javascript implementation for in-browser operation

2.0   3.0   FPOIP

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Applications & Deployments

SOFTWARE-DEFINED RADIO

SATELLITE IMAGERY

UNIVERSITY LABS

MACHINE LEARNING

SPACE TELEMETRY

LIDAR

RADAR

MACHINE VISION

TEST EQUIPMENT

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

Model Complexity

COMMODITY

SUPPORT

CORE

Business Differentiation

You are here

FPGA Module
is Here

Reduce time to market

Build a team that strengthens your core

Simplify your supply chain

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