



# Heterogeneous Extensible Robot Open Platform

*Move beyond basic robotics to AI interaction!*

## Introduction



An environment of automation, human/robot interaction may soon become a reality. Terasic's HERO, a cutting-edge heterogeneous system platform solution with ultra-low power consumption and transcending performance, is designed to speed up the development of intelligent automation, such as medical robots, industrial production robots and autonomous vehicles.

HERO (Heterogeneous Extensible Robot Open Platform) combines Intel 7th Gen Core™ i5-7600T CPU system with the Arria 10 GX FPGA accelerator into a compact system of 177x135x76mm size. The CPU system provides a powerful development environment and a variety of general interfaces. It can communicate with the FPGA card through the high-speed PCIe interface – an advantage that allows the FPGA card to accelerate the performance of various user applications. The rich interfaces (such as GPIO, USB, SPI, mesh and CAN, etc.) on the FPGA accelerator allow users to connect to other systems or sensors for expansion purposes.

HERO fully supports Intel Open VINO™ toolkit to provide optimal Computer Vision and Deep Learning solutions. TensorFlow, MXNet, Caffe and other mainstream learning architectures are supported by HERO too. Our clients' systems can achieve highest computing performance and lowest cost for their AI applications; moreover, they can easily implement heterogeneous execution of the edge to the cloud with HERO.

## What You Can Do

- AI & Deep Learning
- Application Development of the Medical/Service Robot
- Automated Vehicle Application for Specific Scenario
- Data Center Acceleration
- Hardware Security Solution and Gateways

## OpenVINO™ and OpenCL™ Services

- Support Intel OpenVINO™ toolkit
- Support OpenCL™ (HPC) board support package (BSP)

As Intel certified service provider for OpenCL services and development, Terasic also provides customized service to meet the exact needs of our clients.

# Customized Services

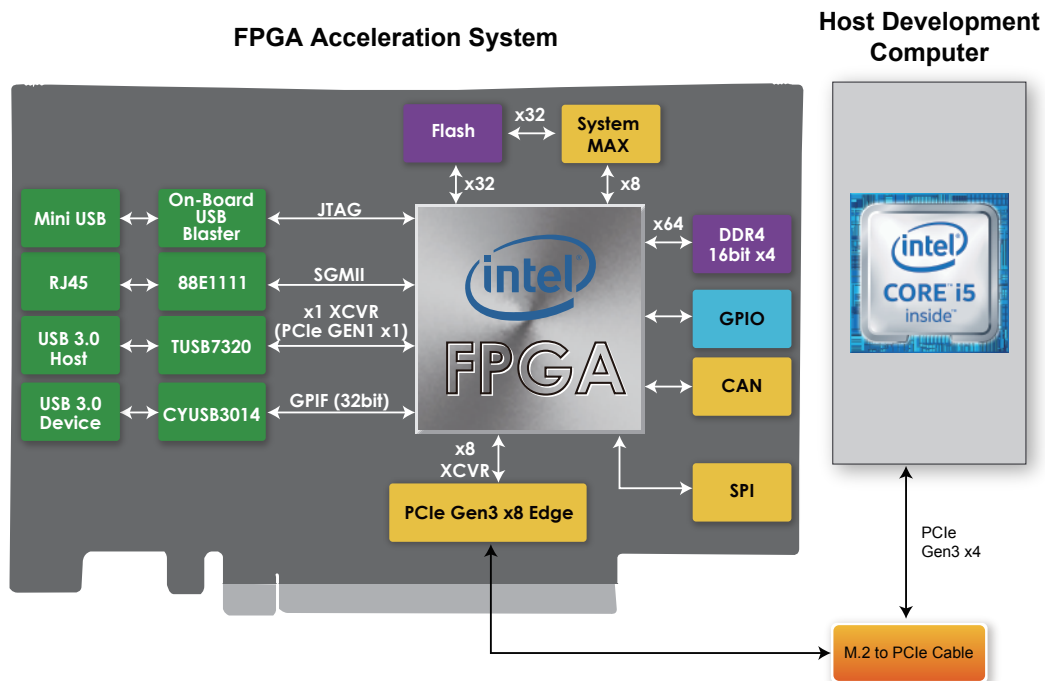
## Hardware and Software Solution

- Terasic has a strong design expertise in FPGA hardware and software.
- Terasic creates FPGA-based products to meet our clients' specific requirements. We excel at delivering ready-to-use and highly optimized systems. Terasic rugged FPGA systems have been deployed in various extreme environments, such as Wall Street's zero-downtime data center and 5G base station in desert.

## Consultancy Services

- At Terasic, we offer assistance to our clients in aspects such as porting, optimization and benchmarking of applications executed on Terasic FPGA Boards. Our support includes software upgrade and OpenCL design services.

# Block Diagram



# Major Specs and Interfaces



## Host Development Computer:

- Intel® Core™ i5-7260U / Intel® Core™ i7-7567U (according to the customer's order request)
- 8GB DDR4-2133 SO-DIMM and 256G GB SSD for storage
- One USB Type-C port, support Thunderbolt 3 , USB 3.1 Gen 2 and DP 1.2

## FPGA Acceleration System :

- Intel Arria 10 GX 10AX115S2F45I1SG device with 1150K Logic elements
- 2GB DDR4 SDRAM (64bit databus@1200Mbps) + 256MB Flash
- Peripheral interfaces : USB 3.0/2.0 /Gigabit Ethernet/UART/GPIO/CAN
- Connect to the Host Development Computer via PCIe Gen3 x4 interface

# Power and Thermals

- 12V-120W external power supply
- Dimensions: length, width and height 177X135X76mm; foot length 7mm