A New Chapter in Embedded Designs
Avnet

Your journey to deliver breakthrough innovation
As you see, our vision is different from the past, which is to deliver innovative products to customers. You must feel it, success is on the horizon if we make great efforts for it. The question is, how to achieve the goals? Avnet has the ability to show you the way and the experience, know-how and resources to get you there.
Every customer we work with has a unique vision and faces challenges that pose potential threats to their success. What sets Avnet apart is how we invest time to clearly understand your environment, goals and objectives. This enables us to craft a tailored plan for achieving your desired outcome. Working together to deliver the most effective solution, you will experience the benefit of engaging Avnet, the guide that will show you the way to reach further.

Services that Support Every Phase of the Journey
We view working through the stages of your products lifecycle as a journey. Each step is a distinct segment but all of the segments must integrate seamlessly to reach the final destination. From initial concept all the way to support your product in the field, Avnet offers verified services to replenish your resources efficiently and effectively.

Our Solutions
Avnet’s 15,000+ global team members have expertise that spans nearly every industry, sector and technology – on Earth and in space. From IoT to embedded systems and integrated solutions, our vast resources can benefit your IP, application or product.

• IoT
• Markets
• Technologies
• Embedded Systems
• Servers and Appliances

Our Services
We guide today’s ideas into tomorrow’s technology – and we’ve been doing it for nearly a hundred years.

• If you’ve got an idea, we’ll guide you through the design.
• If you’ve got a design, we’ll guide you through the supply chain.
• If you’ve got a prototype, we’ll guide you through production.

From idea to product, from product to market, and every step in between, we’ll guide the way so you can reach further.
**Multi-camera Platform**

This solution, developed by Avnet, can support 4 camera video inputs and is also scalable to support more camera inputs.

**Feature:**
- 4 video input frames management and processing
  - Video processing:
    - Perspective correction
    - Fish eye correction
    - Alpha blending
- 4 cameras parallel outputs
  - Multi-layer video display formatting
  - Video scaling & cropping
  - OSD
- Support Bare Metal or Linux
- Support QT GUI development
- 2 demo available
  - Automotive surround view
  - Panorama 360 degree surround view

**System:**
- Xilinx ZC702
- Avnet OV9715 camera module
- Avnet FMC-IMAGEOV


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**Object Recognition Embedded Vision**

This solution, developed by Avnet, can simplify video algorithm acceleration by FPGA implementation and provide the full video path from video input to display, so engineers can focus only on application-specific development.

**Feature:**
- Video analytics development platform
- Video processing development platform
- Complete Camera input with 1080p Video output
- HW/SW Partitioning
  - PS: Keypoint Processing
  - PL: Pixel Processing
  - Mono Conversion
  - FastXCorner (HLS)
  - Descriptors (HLS)
- Linux with QT Environment
  - With Mouse & Keyboard support

**System:**
- Avnet Microzed Embedded Vision Development Kit
- On Semiconductor Python 1300 camera


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**MIPI Solution**

This MIPI solution, developed by Avnet, can support CSI-2 TX/RX and DSI TX features, widely used in video multi-display system.

**Feature:**
- MIPI CSI-2 TX:
  - Support data format RGB565 / YUV4:2:2
  - Support 4 Lane, maximum resolution 1920 x 1080 60fps
  - Support Spartan6, Artix/Kintex
- MIPI CSI-2 RX:
  - Support data format RAW/RGB/ YUV
  - Support 4 Lane, maximum resolution 1920 x 1080 60fps
  - Support Spartan6, Artix/Kintex
- MIPI DSI TX:
  - Support data format RGB888
  - Support 4 Lane, maximum resolution 1080 x 1920 60fps
  - Support Spartan6, Artix/Kintex

**System:**
- Xilinx ZC706
- HDMI 2.0 FMC card
- MIPI DSI Tx FMC card
- MIPI panel

The Motion JPEG encoder solution developed by Avnet can be used in various applications, such as wireless video transmission, low bandwidth video communication, IP camera, etc.

**Feature:**
- Performance: ~2.7 clocks/pixel
- Hardware and Software partition:
  - Processing system (PS)
    - Linux environment
    - File I/O handling
    - AVI & JFIF file headers generation
  - Programmable Logic (PL)
    - RGB to YCbCr conversion
    - DCT, quantization, Zig-Zag scanning
    - 4:2:2 color subsampling
    - VLC-VLI encoding, Huffman encoding

**System:**
- Avnet Microzed Embedded Vision development kit
- On Semiconductor Python1300 camera

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This motor control solution, developed by Avnet, can implement motor control (FOC) algorithm by HDL language. It can be widely used in single/multi axis servo drive and robot applications.

**Feature:**
- Back EMF sensing Sensorless FOC Control
- HW/SW Partitioning
  - PS: System Control, Display & Host communications
  - PL: Performs complete motor control
    - Park/iPark Transform
    - Clark/iClark Transform
    - PWM module
    - PID control loop
- Linux with QT Environment
  - With Mouse & Keyboard support

**System:**
- Avnet Zedboard
- Avnet FMC-MC1 motor card
- PMSM motor

Reference Design

24GHz Radar Solution

Feature:
- Zedboard development kit
- The FMC EVB is a FMCW radar board featured by BGT24MTR12, BGT24 is IFX 24GHz transceiver MMIC with one transmitter and two receiver units with integrated VCO
- Fast development on Radar application (24GHz FMCW FSK)
  - 250MHz bandwidth
  - Distance: 0~76m
  - Resolution: 0.6m
  - Speed: -64km/h…64km/h
  - Speed Resolution: 1km/h
  - Angle: ±32
  - Sample Rate: 600kHz
  - Capable of Detecting: 32 targets

System:
- Avnet Zedboard
- Avnet RF board

HDMI2.0 4K Solution

The HDMI 2.0 4K demo system which includes HDMI 4K FMC card, together with Xilinx KC705/VC707/KCU105, can demonstrate HDMI 2.0 4K input/output/loop path-through.

Feature:
- Support HDMI 2.0 Specification, include HDCP2.2 & 1.4
- Support 4K60fps and downward compatible with all lower resolutions, can also support dynamic switching among various resolutions
- Compatible with most HDMI source & display device
- Rx and tx all using dedicated high speed transceivers

System:
- HDMI 4K FMC Card
  - Include one HDMI2.0 input and one HDMI2.0 output
  - HDMI rx input can feed into FPGA Transceivers through resister network coupling (or using a TMDS181)
  - HDMI tx output use dedicated chip DP159 for level-shift and re-driver purpose
- Xilinx development kits
  - KC705
  - VC707
  - KCU105
- Reference design
  - Tx only mode and Loop path-through mode
  - Support HDCP2.2 & HDCP1.4
  - Ref-design can be generated within vivado IP Catalog tool
**DisplayPort 1.2 Solution**

The DisplayPort 1.2 4K demo system includes DisplayPort 1.2 FMC card, together with Xilinx KC705/KCU105, can demonstrate DisplayPort 1.2 4K input/output/loop path-through.

**Feature:**
- Support DisplayPort 1.2 Specification, include HDCP1.3
- Support 4K 60fps and downward compatible with all lower resolutions, can also support dynamic switching among various resolutions
- Compatible with most DP source & display device
- Input/Output can feed directly in/from FPGA, using dedicated high speed transceivers

**System:**
- DisplayPort 1.2 FMC Card
  - Include one DP1.2 input and one DP1.2 output
  - DP rx input feed into FPGA Transceivers through a DP159 for EQ & Clock recovery
  - DP tx output from FPGA Transceivers using a DP130 for re-driver purpose
  - Support DP1.2 4K 60fps and downward compatible with all lower resolutions
- Xilinx development kits
  - KC705, reference design available
  - KCU105, reference design available
- Reference design
  - Loop path-through
  - Support HDCP1.3

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**12G/6G/3G/HD/SD SDI Solution**

The SDI demo system includes a Fidus 12G-SDI FMC card, together with Xilinx KC705/KCU105, can demonstrate 12G/6G/3G/HD/SD SDI input/output/loopback.

**Feature:**
- Support 12G/6G/3G/HD/SD SDI transmitter
- Support 12G/6G/3G/HD/SD SDI receiver
- Max speed 11.88Gbps
- 12G-SDI operation requires a -3 speed grade, 6G and lower can work on -2 speed grade

**System:**
- Fidus 12G-SDI FMC card
  - Include one SDI input and one SDI output
  - Other 3 ports can be used as input/output
- Xilinx development kits
  - KC705, reference design available
  - KCU105, reference design available
- Reference design
  - Support input/output/loopback (using internal test pattern to drive tx and then feed into rx)
  - Transmitter is controlled by a Vivado Analyzer VIO module
  - The status of the UHD-SDI receiver is monitored by a Vivado Analyzer VIO module
MIPI CSI rx & DSI tx Solution

The MIPI solution, developed by Xilinx, include a CSI rx and DSI tx demonstration, can be used with Xilinx ZCU102, VC707 and KC705 development kits.

**Feature:**
- Support CSI rx, 4 lane, max 1.5Gbps/lane
- Support DSI tx, 4 lane, max 1.5Gbps/lane
- Both Input & output use Meticom dedicated D-PHY chip

**System:**
- CSI rx Demo
  - Sensor: OV13850
  - 1x MIPI CSI FMC Card + Adapter Card
- DSI tx Demo
  - AUO Panel: B101UAN01.7
  - 1x MIPI DSI FMC Card + Adapter Card

Phoenix Contact Software
SoftPLC/SoftMotion/Robot Solution based on ZYNQ

Industrial Robot Software solution from Phoenix Contact is a IEC61131 programmable software platform. Customer can easily develop their own Delta robot controller, SCARA robot controller and any other programmable controllers.

**Feature:**
- Support IEC61131-3 program languages: LD, ST, FBD, SFC, IL
- PLCopen MC P1 v2.0 inside
- EtherCAT Master Stack inside
- Delta, SCARA kinematics inside

**System:**
- Avnet Zedboard
- MultiProg: IEC 61131 program system, from Phoenix contact software
- ISG: PLCopen robot core algorithm module
- Acontis EtherCAT
EPAC (Ethernet POWERLINK Association China)
POWERLINK Solution

Feature:
• Hardware platform: based on Xilinx ZYNQ and Spartan6 device
• Hard Real-time: implemented in HDL language, cycle time < 50us (100Mbps)
• Redundancy: Master redundancy, ring redundancy, cable redundancy
• Topology: support all topologies
• Big data capability: meet requirement of process control and smart factory
• OS: Linux + Xenomai
• Support C/C++ and IEC-61131-3
• Integrated with motion control, electric gear and CAM
• Integrated with Robot control, support Cartesian/SCARA/Delta/ Palletizer/ Anthropomorphic Robot

System:
• EPAC ZYNQ evaluation kit
• EPAC Spartan6 evaluation kit

HMS
Anybus Industrial Ethernet Solution on ZYNQ

Feature:
• Multiple networks support
  - Five major Industrial Ethernet slave protocols in one design: PROFINET RT/IRT, EtherNet/IP, EtherCAT, POWERLINK and ModbusTCP. Transparent Ethernet Channel is also supported
• Same API for all protocols
  - Network independent API helps user to implement a one-time-design to support all networks. HMS offer universal ANSI C driver and SDK for Linux
• High performance
  - All real-time network communication is handled by Anybus IP means that the ZYNQ ARM cores stay free for user applications while Anybus IP with internal RTA handles the communication for best determinism
• Best-in-class technology
  - HMS is the global leading supplier for industrial networks technology and Anybus IP provides the same high performance, flexibility, security and reliability as the HMS classic Anybus CompactCom 40 Series
• HMS supplies a demo version of Anybus IP for EtherCAT on Avnet MicroZed Industry 4.0 Ethernet Kit (I4EK)

System:
• Avnet MicroZed Industry 4.0 Ethernet Kit (I4EK)
KPA
EtherCAT Master/Slave Solution

Feature:
• Support US+ freeRTOS, ZYNQ Vxworks/Xenomai/rt-Preempt/uCOS/freeRTOS/No OS
• Support multi- and single-threaded usage
• Optimized IPcore/MAC/NIC for ZYNQ, low cycle time and jitter
• Excellent anti-jitter mechanism: Shift Sending Time in PL part prevents jitter from OS itself
• Provide source code for OSAL
• Free KPA Studio tools for testing and diagnostics
• Completely compliant to ETG 1500 and provide cable/multi-master redundancy, hot-plug and so on

System:
• Source code in C
• Provide full functional demo for Spartan6/ZYNQ: including DS402 and IPcore demo
• Full functionality: dynamic and static OD, CoE, FoE, EoE, SoE and so on
• No limitations for SM quantity
Reference Design

ACONTIS
ZYNQ EC-master EtherCAT Master Stack Software

**Feature:**
- EtherCAT Master Core - all protocol handling, e.g. Process data transfer and mailbox protocols CoE, EoE, FoE, SoE and AoE
- Real-time Ethernet Driver for GEM for PS site, and for IP core on PL site as well, using zero-copy and/or polling techniques to achieve the best real-time performance and to minimize CPU load
- Compliant with EtherCAT Master Classes Directive (ETG.1500)
- High performance, minimum CPU load, optimized for SMP multi-core operation
- Reliable and well proven in many customer applications worldwide. Market leading companies in the Semiconductor, Robotics, PLC/Motion, Measurement and other industries rely on this software
- Supported operating Systems: VxWorks, QNX, Linux RT-Preempt/Xenomai, uC3 and so on
- Additional features of EtherCAT Master Stack: Hot plug, Cable Redundancy, Master Redundancy, External Synchronization and so on

**System:**
- Avnet Zedboard
- Avnet FMC-ISMNET2 (if using IP core as LinkLayer)

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PS-Micro
Six-Axis Integrated Drive & Control Solution on ZYNQ

ZYNO-based six-axis integrated drive & control solution is a full integration of technical products and services with 6-axis current control IP, software-based speed + position + motion control library, industrial network stack, OS and customization service. This solution is used for a wide range of applications such as 1) industrial robotics including SCARA, Delta and 6-axis robot ARM, 2) collaborative robots as well as high-end service robot, mobile robot and AGV, 3) smart mechatronic systems including automotive radar and education equipment.

**Feature:**
- High Integration: one SoC for six-axis integrated drive & control
- High Performance: current control on Programmable Logic (PL) to achieve high speed response
- Low Cost: 1/5 of the cost of traditional robot drive & control cabinet
- Modularization: flexible for multi-axis control such as 3-axis and 4-axis
- Extensibility: Industrial Ethernet (EtherCAT/Powerlink) and machine vision support

**System:**
- Xilinx ZYNQ XC7Z020-1CLG400I
- OS: AMP mode with embedded Linux and bare-metal
- Encoder: support incremental and absolute encoder, such as Tamagawa
- ADC: support Sigma Delta and SAR type
- IPM: Mitsubishi device, power up to 2KW
- Interface: RS-485, CAN, Ethernet, digital I/O
SoC-e
HSR/PRP Switch IP

SoC-e IP cores are focused on communications for critical systems. These IPs are ready-to-use solutions to integrate sub-microsecond Ethernet based synchronization or Reliable Ethernet in any equipment (IEEE 1588, PRP or HSR, among other standards). It can support Spartan-6 and Zynq device, widely used in smart grid, industrial automation and railway communications.

Feature:
• It switches frames by hardware, very low latency
• It is an all-hardware IP. There is no need for on-chip microprocessor or software stack
• It has been optimized to require few logic resources in order to allow the implementation on low-cost FPGA devices
• It can be used to implement End-Node DAN, RedBox or QuadBox functionalities

System:
• Xilinx SP605 and FMC-ISMNET card
• Avnet MicroZed Industry 4.0 Ethernet Kit
• Xilinx ZC702

GigE Vision
- Transmission rate: 1/2/10Gbps (camera), 1/10Gbps (acquisition card)
- Evaluation kit: SP605, AC701, KC705, ZC702, ZC706

USB3 Vision
- Transmission rate: > 300MB/s
- Compliant to U3V 1.0.1
- Evaluation kit: AC701, KC705, ZC702

CoaXpress
- Transmission rate: 6.125Gbps, 50 meters cable
- Evaluation kit: SP605, AC701, KC705, ZC706

Design Gateway Co., Ltd. is the expert of FPGA logic design and embedded system development. We provide comprehensive solution including hardware, software and firmware. By proposal design service based on rich design property and experience, we can respond to your requests flexibly.

SATA IP core
- Serial ATA (SATA) IP core compliant with the Serial ATA specification revision 3.0
- Work on Xilinx UltraScale, 7-Series, Virtex5/6 and Spartan-6 devices
- This IP core provides link layer and reference design including transport layer and 150MHz GTX physical layer design for 6.0Gbps SATA-III interface. It can connect with SATA-III HDD directly without external Phy chip
- Evaluation Boards: KCU105, KC705, AC701, VC707, VC709, ZC706

NVMe IP core
- NVMe IP core operating with AXI PCIe Bridge IP from Xilinx is ideal to access NVMe PCIe SSD without CPU and external memory. It is recommended for the usage in the application which requires high capacity storage at very high-speed performance. Small size system can be also designed by M.2 storage which uses PCIe protocol standard
- The IP core license includes the reference design for Xilinx FPGA boards. It helps you to reduce development time and cost
- Evaluation Boards: KCU105, ZC706, mini-ITX, KC705, VC707, VC709

TOE10G IP core
- TOE10G IP core is the epochal solution implemented without CPU
- TOE10G IP core automatically takes over all functions of TCP/IP protocol which needs high-speed operation by hardware logic only
- This IP product includes reference design for Xilinx FPGA. It helps you to reduce development time
- Evaluation Boards: ZC706, KC705, VC707

USB3.0 IP core
- USB3.0 IP core compliant with the USB 3.0 specification Revision1.0
- Work on Xilinx 7-Series, Spartan-6 and Virtex-6 devices
- This IP core provides link layer and protocol layer. Physical layer interfaces to PHY chip by TI
- Evaluation Boards: ZC706, KC705, SP605, ML605
Development Kit

MicroZed is a low-cost development board based on the Xilinx Zynq®-7000 All Programmable SoC. Its unique design allows it to be used as both a stand-alone evaluation board for basic SoC experimentation, or combined with a carrier card as an embeddable system-on-module (SOM).

**Feature:**
- SoC
  - XC7Z010-1CLG400C
- Memory
  - 1 GB of DDR3 SDRAM
  - 128 Mb of QSPI Flash
  - Micro SD card interface
- Communications
  - 10/100/1000 Ethernet
  - USB 2.0
  - USB-UART
- User I/O (via dual board-to-board connectors)
  - 7Z010 Version
    - 100 User I/O (50 per connector)
    - Configurable as up to 48 LVDS pairs or 100 single-ended I/O

**Part:**
- AES-Z7MB-7Z010-G | See online catalog*
- AES-Z7MB-7Z010-SOM-G | See online catalog*
- AES-Z7MB-7Z020-SOM-G | See online catalog*

* Visit online catalog: www.avnet.com

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PicoZed is a highly flexible, rugged, System-On-Module, or SOM that is based on the Xilinx Zynq®-7000 All Programmable (AP) SoC. It offers designers the flexibility to migrate between the 7010, 7015, 7020, and 7030 Zynq-7000 AP SoC devices in a pin-compatible footprint.

**Feature:**
- User I/O (via three board-to-board connectors)
  - 7Z010 Version
    - 113 User I/O (100 PL, 13 PS MIO)
    - PL I/O configurable as up to 48 LVDS pairs or 100 single-ended I/O
  - 7Z015 Version
    - 148 User I/O (135 PL, 13 PS MIO)
    - PL I/O configurable as up to 65 LVDS pairs or 135 single-ended I/O
    - 4 GTP transceivers
  - 7Z020 Version
    - 138 User I/O (125 PL, 13 PS MIO)
    - PL I/O configurable as up to 60 LVDS pairs or 125 single-ended I/O
  - 7Z030 Version
    - 148 User I/O (135 PL, 13 PS MIO)
    - PL I/O configurable as up to 65 LVDS pairs or 135 single-ended I/O
    - 4 GTX transceivers

**Part:**
- AES-Z7PZ-7Z010-SOM-G | See online catalog*
- AES-Z7PZ-7Z015-SOM-G | See online catalog*
- AES-Z7PZ-7Z020-SOM-G | See online catalog*
- AES-Z7PZ-7Z030-SOM-G | See online catalog*

* Visit online catalog: www.avnet.com
**Development Kit**

### Avnet MiniZed

MiniZed is a single-core Zynq 7Z007S development board. With the advent of the latest cost-optimized portfolio from Xilinx, this board targets entry-level Zynq developers with a low-cost prototyping platform.

**Feature:**
- Xilinx Zynq XC7Z007S SoC
- Micron 512 MB DDR3L
- Micron 128 MB QSPI flash
- Micron 8GB eMMC mass storage
- USB 2.0 host interface
- Arduino-compatible shield interface
- 2 x Pmod-compatible interfaces

**System:**
- MiniZed

**Part:**
- AES-MINIZED-7Z007-G | $89 USD
  [http://zedboard.org/product/minized](http://zedboard.org/product/minized)

### Avnet UltraZed-EG Starter Kit

The UltraZed-EG™ Starter Kit consists of the UltraZed-EG System-on-Module (SOM) and IO Carrier Card bundled to provide a complete system for prototyping and evaluating systems based on the Xilinx powerful Zynq UltraScale™ MPSoC device family.

**Feature:**
- Xilinx XCZU3EG-1SFVA625 device
- DDR4 SDRAM (2GB, in X32 configuration)
- Dual QSPI Flash (64MB)
- 12C EEPROM (2Kb)
- eMMC Flash (8GB, in x8 configuration)
- USB 2.0 ULPI PHY
- Gigabit Ethernet PHY
- 12C 8-bit I/O expander
- Linux BSP and reference designs
- 3 JX micro-header connectors (2 x 140-pin, 1 x 100-pin) providing the connections to the Carrier Cards

**System:**
- UltraZed-EG SOM
- UltraZed IO carrier card

**Part:**
- AES-ZU3EG-1-SK-G | $895 USD
## Development Kit

### Avnet UltraZed-EV Starter Kit

The UltraZed-EV Starter Kit consists of the UltraZed-EV System-on-Module (SOM) and Carrier Card bundled to provide a complete system for prototyping and evaluating systems based on the Xilinx powerful Zynq UltraScale+ MPSoC EV device family.

**Feature:**
- **ULTRAZED-EV SOM**
  - UltraZed-EV SOM is a high performance, full-featured, System-On-Module (SOM) based on the Xilinx Zynq UltraScale+ MPSoC EV family of devices. Designed in a small form factor, the UltraZed-EV SOM on-board dual system memory, high-speed transceivers, Ethernet, USB, and configuration memory provides an ideal platform for embedded video processing systems. Designers can simply design their own carrier card, plug-in UltraZed-EV SOM, and start their application development with a proven Zynq UltraScale+ MPSoC sub-system.
- **ULTRAZED-EV CARRIER CARD**
  - The UltraZed-EV Carrier Card supports the UltraZed-EV System-on-Module (SOM), providing easy access to the full 152 user I/O, 26 PS MIO, 4 PS GTR transceivers, and 16 GTH transceivers available from the UltraZed-EV SOM via three Micro Headers. The UltraZed-EV Carrier Card is a great vehicle for validating the UltraZed-EV SOM and provides an excellent starting point for creating your own UltraZed-EV custom carrier card.

**Part:**
- AES-ZU7EV-1-SK-G | $1,595 USD
  

### Avnet MicroZed Embedded Vision Development Kit

The MicroZed Embedded Vision Development Kit builds on the MicroZed SOM by providing a video specific carrier card. The kit includes hardware, software and IP components necessary for the development of custom video applications.

**Feature:**
- **MicroZed 7020 SOM**
- **Embedded Vision Carrier Card**, including:
  - HDMI Input (based on ADI ADV7611)
  - HDMI Output (based on ADI ADV7511)
  - Camera Connector (for optional camera modules)
  - Power over Ethernet (PoE) Interface (based on ST PM8803)

**System:**
- **MicroZed 7020 SOM**
- **Embedded Vision Carrier Card**

**Part:**
- AES-Z7MB-7Z020-SOM-G | See online catalog*
  
  [http://zedboard.org/product/microzed](http://zedboard.org/product/microzed)
- AES-MBCC-EMBV-G | $279 USD

* Visit online catalog: [www.avnet.com](http://www.avnet.com)
Development Kit

Avnet
PicoZed Embedded Vision Development Kit

The PicoZed Embedded Vision Development Kit builds on the PicoZed SOM by adding video specific interfaces. The kit includes hardware, software and IP components necessary for the development of custom video applications.

Feature:
- PicoZed 7030 SOM
- FMC-HDMI-CAM FMC module, including:
  - HDMI input (based on ADI ADV7611)
  - HDMI output (based on ADI ADV7611)
  - Camera connector (for optional camera modules)
- PYTHON-1300-C camera module, including:
  - PYTHON-1300 Color Image Sensor
  - Lens holder
  - Lens (C-mount, 2/3" optical size, 8 mm)
  - IR cut filter

System:
- PicoZed 7030 SOM
- FMC-HDMI-CAM FMC module

Part:
- AES-Z7PZ-7Z030-SOM-G | See online catalog* http://zedboard.org/product/picozed
- AES-CAM-ON-P1300C-G | $499 USD http://zedboard.org/product/python-1300-c-camera-module

* Visit online catalog: www.avnet.com

Avnet
MicroZed Industrial IOT Starter Kit

The Avnet MicroZed Industrial IoT Starter Kit supports designers’ edge-to-cloud development of Internet-connected solutions and includes all the necessary building blocks for developing a production-ready, IoT-enabled, industrial processing system.

Feature:
- Cloud enabled
  - Supports IBM Watson Services
  - Watson IoT ready
- Production ready, MicroZed 7010 SOM
  - Based on Xilinx Zynq-7000 SoC
  - Dual ARM Cortex™-A9 processing system
  - FPGA logic
- Expandable development platform
  - R3 Arduino-compatible shield expansion slot
  - Two 2x6 peripheral module expansion slots
  - Additional user header providing access to SPI, I2C, UART, and GPIO on MicroZed
- Pluggable sensor options
  - ST Microelectronics motion MEMS and environmental sensor shield
  - Maxim Integrated thermocouple-to-digital peripheral module
  - Infineon SLB9670 TPM Pmod

System:
- MicroZed 7010 SOM
- ST Microelectronics sensor shield
- MicroZed Carrier Card for Arduino

Part:
- AES-Z7MB-7Z010-SOM-G | See online catalog* http://zedboard.org/product/microzed
- AES-ARDUINO-CC-G | $89 USD http://zedboard.org/product/arduino-cc
- X-NUCLEO-IKS01A1 | $14.69 USD
- MAX31855PMB1# | $19.89 USD

* Visit online catalog: www.avnet.com
## Development Kit

### Avnet MicroZed Industry 4.0 Ethernet Kit

**Feature:**
- EtherCAT, EtherNet/IP, Profinet RT/IRT, Modbus-TCP
- Dedicated FPGA core for protocol stack
- Common API for all protocols
- Linux drivers and example applications
- Simple IP evaluation and licensing
- One Gigabit Host Ethernet port
- Two Industrial Network ports
- Dual CAN transceivers

**System:**
- MicroZed 7020 SOM
- ISM Networking Module II
- MicroZed FMC carrier

**Part:**
- AES-Z7MB-7Z020-SOM-G | See online catalog*  
  [http://zedboard.org/product/microzed](http://zedboard.org/product/microzed)
- AES-FMC-ISMNET2-G | $250 USD  
- AES-MBCC-FMC-G | $149 USD  

* Visit online catalog: [www.avnet.com](http://www.avnet.com)

### Avnet UltraZed PCIe Carrier Card

**Feature:**
- Single UltraZed-EG SOM slot
- microSD card connector
- PS Pmod header
- Dual USB-UART
- PCIe x1 Endpoint
- USB 2.0/3.0 connector
- SATA host interface
- RJ45 connector
- FMC LPC slot
- Digilent USB-JTAG module

**Part:**
- AES-ZU-PCIIECC-G | $499 USD  

### Avnet TDNext 1.26Mpixel Pmod Camera Kit

**Feature:**
- TDNext dual 2x6 Pmod adapter
- TDM114 camera module, including:
  - ON Semiconductor 1/6" MT9M114 color image sensor
  - 720P30 resolution (1296 x 976 @ 30fps)
  - 8/10 bits CMOS parallel Interface
  - HFOV 90°
  - IR cut filter for daylight illumination

**Compatible with:**
- ZEDBOARD
- MICROZED
- PICOZED
- ULTRAZED
- MINIZED

**Part:**
- AES-PMOD-TDM114-G | $69 USD  

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The UltraZed PCIe Carrier Card supports the UltraZed-EG System-on-Module (SOM), providing easy access to the full 180 user I/O, 26 PS MIO and 4 PS GTR transceivers available from the UltraZed-EG SOM via three Micro Headers.

The TDNext 1.26Mpixel Pmod Camera Kit allows the low cost, production-ready TDM114 camera module to be populated on Avnet’s Pmod enabled Xilinx development kits.
Development Kit

**Digilent ARTY S7-50**

The Arty S7 board features new Xilinx Spartan-7 FPGA and is the latest member of the Arty family for Makers and Hobbyists. The Spartan-7 FPGA offers the most size, performance, and cost-conscious design engineered with the latest technologies from Xilinx and is fully compatible with Vivado Design Suite.

**Feature:**
- Xilinx XC7S50-CSGA324
- 256 MB DDR3L with a 16-bit bus @ 650 MHz
- 128 Mbits Quad-SPI Flash
- Internal clock speeds exceeding 450MHz
- On-chip analog-to-digital converter (XADC)
- Programmable over JTAG and Quad-SPI Flash
- 100 MHz External Clock

**Part:**
- ARTY S7-50 | $109 USD

**Deephi Tech Aristotle DPU Dev Board**

**Feature:**
- CNN Accelerator on Xilinx XC7Z020
- Wide CNN support: VGG, ResNet, GoogLeNet, Yolo, SSD, etc.
- Development kit: DNNDK with compression tool and compiler inside
- Peak Performance: 230GOPS
- Power consumption: 4W
- Interface: USB 2.0, GbE, HDMI, TF card reader, 2* CMOS camera interface, GPIO, JTAG, I2C, CAN, SPI
- Dimension: DPU board 31 x 67mm, base board 100 x 110mm
- Power supply: 5V, 2A

http://www.deephi.com

**Keystone Microtech VU440 Prototype Board**

Providing high-performance verification platform for highly integrated ASIC design

**Feature:**
- Xilinx FPGA XCVU440
- GTH Transceiver up to 16Gbps
- DDR4 up to 2133Mbps
- Service for daughter card customization
- Support Si/PI simulation, ensure the best performance.
- Full platform functionality including:
  - Internet connection with remote control
  - Multi-user and authority setting
  - Support multiple clocking setting
  - Flexible of voltage configuration that is for all IO standard

Development Kit

Flyslice Technologies
FX410QL FPGA Accelerator Card

Feature:
- Xilinx Kintex Ultrascale KU115 (FLVF1924) with 1.5 million logic cells
- 4 channel DDR4 memory 4*4GB DDR4@72bit with ECC
- Bandwidth: 2400MT/s @ 4GB x72 ECC
- 2*8 Lane PCI Express 3.0 with On-Board JTAG interface
- OPENCL Programmable
- Supported with Xilinx SDAccel Development Environment for OpenCl, C, C++

Optional feature:
- CAPI (Coherent Accelerator Process interface) support
- Board Support Package support CentOS 6.6 or above
- RSA IP support RSA2048 encryption-decryption @ ≥40K ops/s (2048bit keys)
- Passive/Active heatsink
- Form Factor: Low profile, Half Length (68.9mm X 167.7mm)

http://www.flyslicex.com

Myirtech
ZYNQ: Z-turn Board

Feature:
- Xilinx XC7Z010/020 Dual-core ARM Cortex-A9 Processor with Xilinx 7-series FPGA logic
- 1GB DDR3 SDRAM (2 x 512MB, 32 bit), 16MB QSPI Flash
- USB-UART, USB2.0 OTG, Gigabit Ethernet, CAN, HDMI, TF
- Three-axis Acceleration Sensor and Temperature Sensor
- Ready-to-Run Linux Single Board Computer
- Optional Camera and WiFi Modules, IO Extension Cape
- Dimensions: 62 x 102mm
- Support Linux3.15.0, Ubuntu Desktop 12.04

http://www.myirtech.com

Dimtech
Vision Development Kit

Feature:
- Core board
  - Support industrial grade product
  - Xilinx ZYNQ: FPGA + dual core Cortex-A9
  - Dimensions: 5 x 5.5cm, compact size
  - Provide tri-state IO, support multi-protocol data switching, 4A power supply
  - 512Mbits DDR3 SDRAM, 128Mbits QSPI Flash
  - Hardware platform and embedded software stack. Together with flexible development tools, it can demonstrate hardware and software co-processing advantages, utilize new architecture to meet camera product design
  - Development kit
    - Includes DIM CORE V1 core board and DIM IO V1 carrier board
    - Dimensions: 60 x 100mm
    - Turn-key solution available
    - Production ready
    - Easy development, save 50% design time
    - Scalable

http://www.dim-tech.cn
AT AVNET, WE HELP YOU REACH FURTHER

From idea to design and from prototype to production, Avnet supports customers at each stage of a product’s lifecycle. A comprehensive portfolio of design and supply chain services make Avnet the guide for innovators who set the pace for technical change. For nearly a century, Avnet has helped its customers and suppliers around the world realize the possibilities of technological transformation.

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