

SBC1654 Vision Kit Integrates ARM Cortex-A8 with Spartan-6 FPGA, MIPI CMOS Camera Sensor, and OpenCV

Development Kit Features:

Firmware

- Linux BSP with U-Boot, Linux kernel, Ubuntu, or GNOME mobile built with Yocto
- Micro/sys' Vision Layer integrates powerful tools, libraries and sample programs
- Micro/sys' Yocto recipes enable users to create custom Linux distribution for applications

Software

- Easy access to OpenCV and GStreamer
- ARM® NEON™ GPU configurable for multimedia apps
- Sample application programs

Hardware

- SBC1654 single board computer included in Kit
- MIPI CSI camera sensor plugs directly onto SBC1654 via stackable connector
- I2C and SPI sensor interfaces provided
- IPU and GPU sample programs

User Programmable FPGA

- Xilinx Spartan-6 FPGA #XC6SLX16
- Use ISE® development tools from Xilinx
- FPGA 95% available for user's applications
- Compatible with Xilinx vision cores

OEM SBC1654 Features:

- ARM Cortex®-A8, 800 MHz
- Xilinx Spartan®-6 FPGA
- Dual MIPI CSISM camera ports, serial and/or parallel
- 512 MB SDRAM, 4GB Flash, 4MB SPI NOR Flash
- LCD Touchscreen plus NEON GPU
- Two SD/MMC card slot
- Dual CAN Bus Interface
- Four USB ports
- Three serial ports (RS232 and RS485)
- PC/104 form factor
- Extended temperature operation
- See SBC1654 datasheet for more details



DKV1654 Contents: SBC1654, MIPI CSI camera, sample software, display, cables, and breakout assemblies

Vision Integrated Development Platform:

The DKV1654 is a ready-to-run vision development platform which includes Micro/sys' SBC1654 ARM Cortex-A8 single board computer and a MIPI CSI camera sensor. The Development Kit eliminates the need for users to spend days or weeks integrating the complex hardware, firmware and software components of a vision system. The turnkey DKV1654 provides a Linux BSP hosted on the board which includes the integrated vision firmware layer. This layer provides users access to open source vision tools and sample software. Users slip the SD card into the socket, plug on the camera sensor module and enjoy video through the TFT display. An add-on FPGA development kit is available which includes firmware and tools to program the onboard Spartan-6 with vision processing cores.

CSI vs. USB: Who has the Advantage?

With the introduction of heterogeneous CPUs such as Freescale's iMX5 and 6, implementing vision applications using the processor rather than a USB I/O channel has become more appealing because the ARM Cortex, as a multi-core processor, already includes GPUs and MIPI camera interfaces.

Using a webcam style USB camera requires a lot of system level CPU time since USB is handled directly by the CPU. By using a MIPI CSI port directly from the CPU, the video is routed automatically to an onboard GPU, relieving the CPU of vision processing tasks by as much as 35%—resulting in better overall system performance and better vision results.

Inadequate software tools made working with a GPU and MIPI camera interfaces difficult in the past. Today these barriers are being overcome with more fully integrated Board Support Packages giving users access to the tools they need to write applications without difficult integration.



DKV1654 Provides a User-Friendly, Flexible Development Environment

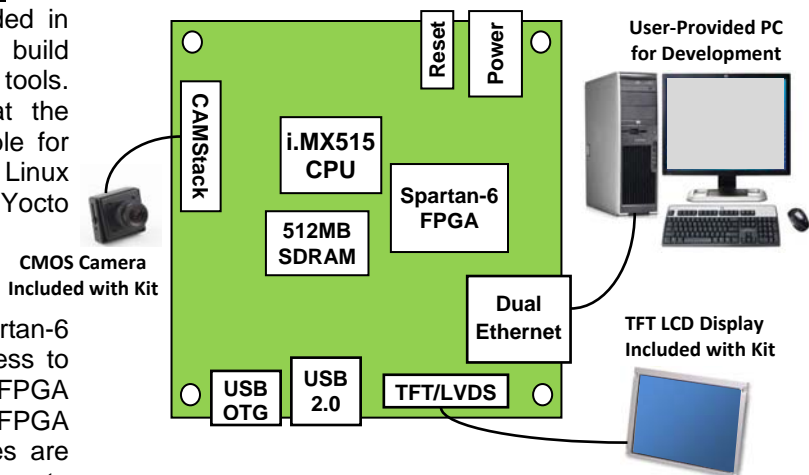
The powerful advantage of the DKV1654 is ease of use and system level options for implementing embedded vision systems

Linux BSP Eases Application Program Development

The SBC1654 ships with a Linux image pre-loaded in NAND flash plus an SD card with the full Linux build including a comprehensive suite of development tools. Users can begin programming the SBC1654 at the command line out of the box. Eclipse is available for remote or local debug. For the more advanced Linux user, a full cross-development environment using Yocto is also available.

FPGA Development Kit Uses Standard Xilinx tools

Micro/sys' FPGA Development Kit for the Spartan-6 installs on top of the Linux OS and provides access to interfaces between the iMX515 and the Spartan-6 FPGA via a 16-bit memory bus. Users have 90% of the FPGA available for their use. Some sample FPGA cores are included. Users must register with Xilinx for access to Xilinx tools.



The combination of Micro/sys' Vision Development Kit and FPGA Development Kit provides users turnkey operation, saves man-weeks of setup and integration, plus ensures users they spend their development time concentrating on their application rather than generic system integration having nothing to do with their application.

Vision Development Kit Contents:

Board, Camera & Display

- SBC1654 (Linux or WindowsCE)
- MIPI CSI CMOS camera module
- Stackable MIPI CSI CMOS camera carrier board
- 7in TFT LCD display
- 5V wall-mount power supply
- 4 GB Solid State Drive (SSD)
- RJ45 Ethernet Cable
- Mini B to Type A USB 2.0 Cable
- (2) 20-pin high density to 20-pin screw terminal
- (1) 50-pin high density to 50-pin screw terminal
- (4) 40-pin high density to 40-pin screw terminal

Board Support Package (BSP):

- U-Boot, kernel, Ubuntu, or GNOME Mobile
- Micro/sys Vision Layer/Recipe

Targeted Reference Designs & Demos

- How to implement ARM Cortex
- How to implement drivers to DDR3 memory
- How to implement DIO and drivers

Documentation

- SBC1654 Getting Started Guide
- SBC1654 Hardware User Manual
- Yocto Whitepaper
- OpenCV Whitepaper
- Popular StackableUSB™ expansion bus

Ordering Information:

DKV 1654 - ET - L

