

Doc ID:	DPLS_PB003	File:	DPLS_PB003 A_Core ProdBrief.odt
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A-Core

Preliminary Product Brief

Overview

A-Core is a System-on-Chip targeting visual perception. The chip integrates all necessary resources (front-end frame processing and feature extraction, programmable engine for scene analysis and object detection, image RAM). Engineers with limited or no knowledge of vision algorithms can use it as a "black box" in their designs, while experts can further program it to achieve superior performance for their applications.

Using an optimized API, the A-Core can be programmed to perform specific tasks as a complete vision system on a chip. It can also be integrated on a processor-based system for non-stand-alone applications.

Features

- Complete Solution, Image-to-Application
- Image Sensor Interface (resolutions: 100K - 4.1M pixels)
- Fast hardware-based feature extraction
- Programmable pattern matching and object registration
- On-chip RAM for images and objects
- Two on-chip RISC cores for system level tasks and perception algorithms
- Detection of at least 50 objects per scene
- Full scene analysis at 1-30 frames/sec (fps)

Supported Interfaces

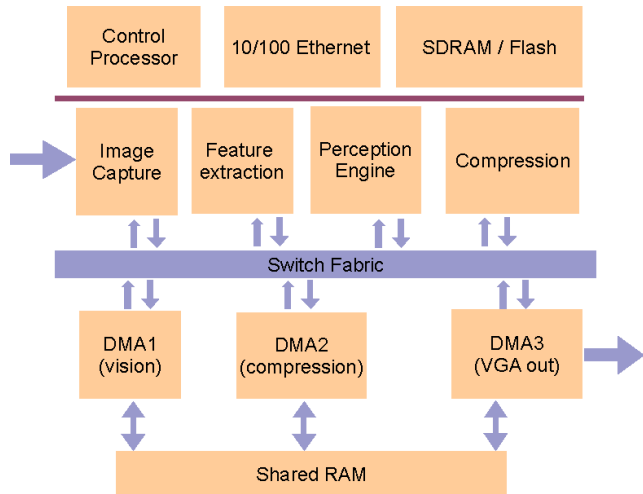
The interface for receiving images supports a wide range of array image sensors. Frames can also be received from any stream of data or loaded from RAM. Images can be sent over ethernet or displayed on an attached screen.

Example Applications

A-Core can be applied to a wide variety of systems that employ machine vision. A short non exhaustive list is:

- Smart industrial cameras and Vision Sensors.
- Advanced surveillance cameras.
- Camera Toys that use body/hand as user interface.
- 2D and 3D scanning systems.

Architecture



The architecture is built on four image processing engines attached to a common control bus (AHB™). The front-end engines perform image capture, pre-processing and feature extraction. Scene and object analysis is performed at a programmable perception engine. A compression engine is used for preparing image and video for transmission.

System Configurations

Depending on the product type, A-Core chips can be integrated in three configurations:

- *Minimum Cost*, with minimal external memory and no external processor. Can support low resolution, at 2-10 fps with at least 5 identifiable objects per scene.
- *Typical Mobile*, with normal external memory to support larger image sizes. No need for external processor. Can support medium resolution up to 30 fps and more than 10 objects per scene.
- *Performance*, with multi-frame external memory. An external processor may be needed for system-level tasks. Supports high resolution, runs up to 60 fps and handles over 50 objects per scene.

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