IMAGO TECHNOLOGIES

VisionBoxes, VisionBoards, VisionCams & Engineering

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The Heart of Your Vision System

VisionBox

The Concept:

A Real-Time Communication Controller with vision & automation specific interfaces combined with an embedded Intel, ARM or TI processor, this is the philosophy of the VisionBox and VisionBoards. In series, IMAGO delivers the VisionBoxes ready to run, including customer-specific SD- or SSD-image, qualified 3rd-party components and acceptance test:

- Real-Time Communication Controller RTCC:
  - Controls vision & automation specific interfaces:
    - Digital I/Os
    - Encoder
    - Camera Trigger
    - LED Strobe Controller
  - Contains functional units for controlling I/Os in real time:
    - Trigger unit: creation of trigger signals, derived from other inputs (e.g. encoder)
    - I/O scheduler: applies values stored in a FIFO to outputs in real time (based on trigger event, encoder position, or timer value)
    - Multiplexer: flexible connection of functional units
  - Operates independently from the OS & the x86 processor
  - Easy to use high-level API for C++, .NET and support by 3rd-party software tools
- Camera Interfacing (depending on VisionBox type):
  - Four independent GigE Vision ports with optional PoE available
  - Real-time Trigger-over-standard-Ethernet cable from RTCC with a µs-jitter
  - Camera Link includes PoCL and real-time trigger from RTCC. The integrated frame grabber allows up to 1× Deca or 2× Base, depending on the configuration and box type
  - Unique Camera Link output configuration to send preprocessed data, e.g.: CL Full input → Preprocessing → CL Base output
  - Integrated USB 3.0 interface with 4 ports transfers up to 5 Gbit/s. Power supply inside AGE-X ensures sufficient power-up for cameras as well as current limitation for safety
  - USB 3.0 interface boards with 4 controllers and 4 ports available
- Digital I/Os:
  - Opto-isolated
  - Status LEDs in most AGE-X
  - Inputs up to 5 MHz with debouncing in RTCC. Communicated via interrupt or polling
  - Outputs up to 50 kHz / up to 1 A / up to 48 V

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- x86 Processor
  - Intel processors from Celeron to i7
  - Different versions of Windows Embedded 7
  - IMAGO-Linux or Real-Time-Linux

- ARM Processor
  - Up to 8 core ARM Cortex-A72
  - IMAGO-Linux

- TI Processor
  - KeyStone DSP from Texas Instruments with fixed and floating point unit
  - 2 … 8 cores with up to 160 GFLOPs
  - Multicore real-time operating system TI-RTOS

- VisionBoards
  - For use in VisionBoxes with PCIe slots or 3rd-party IPCs
  - Interconnection for comprehensive functionality

- Software Support
  - Easy-to-use high-level C/C++ API for control of all interfaces
  - API for Camera Link & GigE Vision cameras
  - Optional usage of Halcon embedded, OpenCV & other 3rd-party tools

- Housing
  - Passive cooling of processor
  - All interfaces on front panel (OCTA front and rear panel)
  - 24 VDC power input
  - No moving parts

- More Vision & Automation Interfaces
  - RS-422 In-/Outputs for encoders, used with RTCC
  - LED Controllers up to 6 A_{Peak} / 0,5 $A_{continuous}$
  - Fieldbus interfaces like Profinet, Profibus, EtherCAT, Sercos III, CAN,…
  - RS-232
  - More interfaces upon request

- OEM Configurations upon Request
  - Application specific implementation of FPGA functions for handling of in- and output data
  - Application specific implementation of functions for image processing
  - VisionBoards in 3rd-party IPCs
  - VisionBlackBox

Services

The Soul of Your Vision System

Creating a clever machine vision system is more than just buying parts.

That's why we offer first class engineering services prior to design and create the exact product your system needs. All our products are tailored to OEM/ODM level from scratch and manufactured right in time for your production.

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The Eye of Your Vision System

VisionCam

The Concept:

An embedded processor combined with the Real-Time Communication Controller for vision & automation specific interfaces, this is the philosophy of the VisionCam family. We offer several base configurations. In series, IMAGO delivers the VisionCam in customer specific version including extensive acceptance tests:

- Camera Sensor:
  - CMOS sensors up to 2 Megapixels and up to 60 fps at full resolution are available for VisionCams XS & XM
  - Roadmap 2017:
    - More resolution and higher speed for area sensors
    - Various line scan sensors
- Real-Time Communication Controller
  - Controls vision & automation specific interfaces
    - Fieldbus interface
    - Digital In- & Outputs
    - Encoder Input (RS-422)
    - Camera Trigger
    - LED Controller
  - Contains functional units for controlling I/Os in real time:
    - Trigger unit: creation of trigger signals, derived from other inputs (e.g. encoder)
    - I/O Scheduler: applies values stored in a FIFO to outputs in real time (based on trigger event, encoder position, or timer value)
    - Multiplexer: flexible connection of functional units with each other
  - Operates independently from ARM/DSP processor
  - Easy-to-use high-level API for C/C++
- LED Controller:
  - Up to 2 A per strobe pulse
  - Integrated LED ring light
  - Output for external LED light heads
- Fieldbus:
  - Real-Time Ethernet connected directly to processor
  - Supported protocols:
    Profinet, EtherCAT, Sercos III, Powerlink,…
- Digital In- & Outputs:
  - Opto-isolated
  - Status LEDs
  - Input up to 5 MHz with adjustable debouncing
  - Outputs up to 50 kHz
- Processor
  - VisionCam XM: TI Sitara
    - 2× ARM Cortex-A15
    - 2× C66x DSP
    - Programmable real-time units
  - VisionCam XS: TI DaVinci
    - C64x DSP
- Housing
  - Passive cooling without heat sink
  - IP 65 version available
  - 12 - 24 V_{DC} power input
  - Lens mount options:
    C, CS, S and integrated lenses
  - µSD-card under service hatch

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