

HiPERCAM V

Industrial and Mobile Camera Platform

Intelligent Camera with Video Output

- 2 Megapixel CMOS sensor
- Configurable frame rates and resolutions
- Video transmission over Gigabit Ethernet
- Direct-attach HDMI

Preliminary

III Main Features

- 2 Megapixel CMOS sensor
- Configurable frame rates and resolutions
- Video transmission over Gigabit Ethernet
- HDMI monitor connection via DVI-D, FullHD image
- FPGA for image preprocessing
- Designed for harsh industrial and mobile applications
- 0 to +55 °C operating temperature
- Integrated firmware for management and configuration

III Description

The HiPerCam V is a digital camera module with a FullHD CMOS sensor module. It is particularly designed to meet requirements of industrial applications, for example process surveillance in large industrial machines. A single Ethernet cable is required to connect the HiPerCam V to a computer or display, and in the same time to power the module via PoE. The Ethernet connection allows for long cable runs up to 100 m, providing full flexibility when architecting and cabling the surveillance infrastructure even in larger systems.

The HiPerCam V is by default equipped with a 2 Megapixel CMOS sensor which can deliver 30 frames per second at maximum resolution of 1920 x 1080 pixels, i.e. full HDTV resolution. Other resolutions and frames rates can be adjusted as required. Sensor pixel binning (up to 4 linearly) is supported for better sensitivity at reduced resolutions.

The HiPerCam V is equipped with a Freescale i.MX6 DL SoC, featuring an embedded ARM CPU with 1000 MHz clock and useful co-processors such as GPU, IPU, VPU, and video codecs for H.264 video data encoding. The onboard DDR3 memory can be extended in size to 2 GB, for embedded video recording and playback.

The CPU executes a tailored Linux operating system which builds the foundation for different image processing applications and network protocols such as GigE Vision and TCP/IP. As an OEM option the CPU is available in quad core versions with faster cores and enhanced GPUs allowing for more sophisticated image processing algorithms inside the camera.

An on-board FPGA is present for image preprocessing and correction. The incoming camera image undergoes a correction for lens distortions, so even low-cost M12 lenses can be used for un-distorted images. Furthermore, the image can be contrast-enhanced and edges can be sharpened if required.

The Gigabit Ethernet Interface allows transfer speeds that are adequate for real-time streaming of the video data. The Ethernet MAC is implemented using Intel's state of the art I210 which provides hardware enhancements for the implementation of real-time Ethernet (AVB and IEEE 1588) and is thus a key building block for future technology developments.

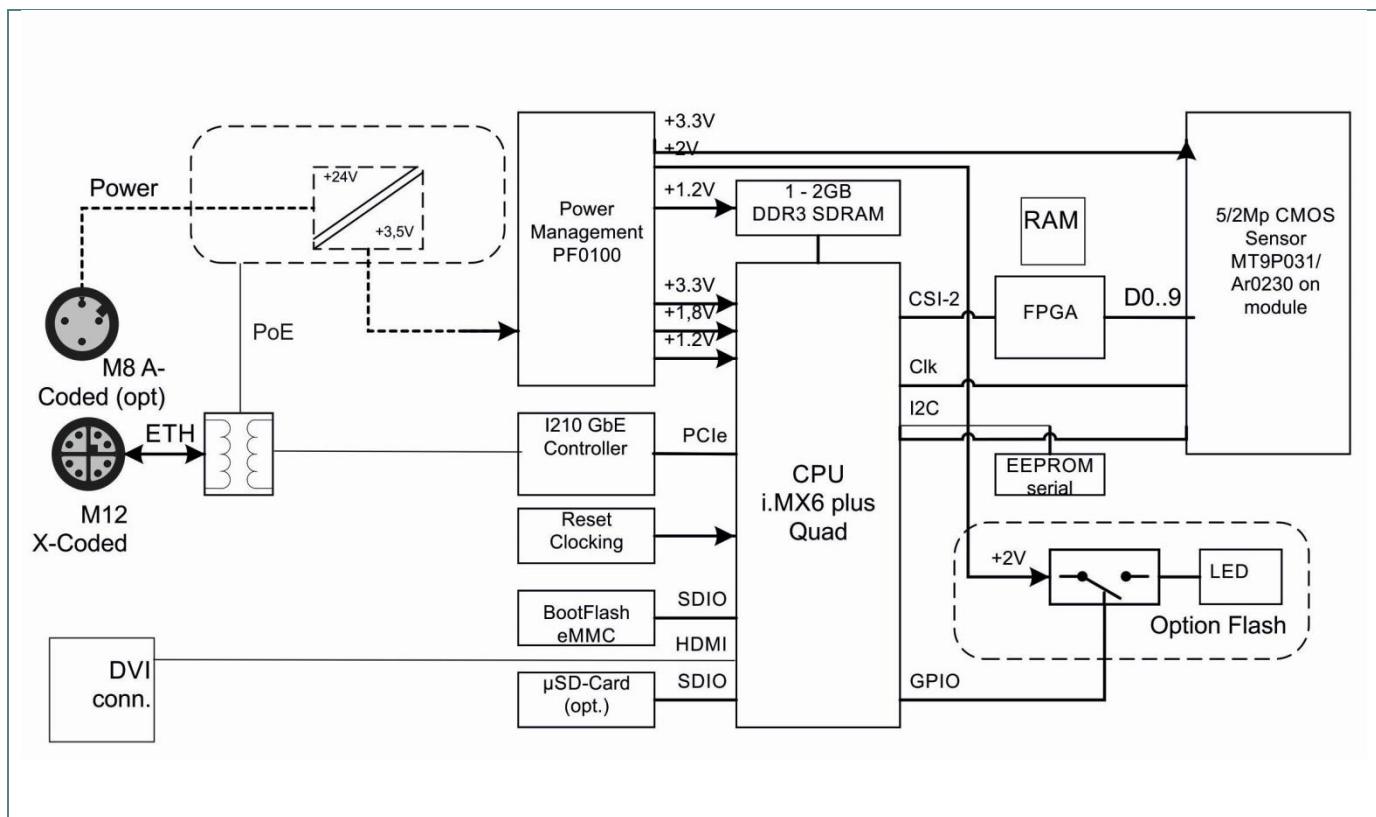
The HiPerCam V is powered via Ethernet (PoE) and normally acts as IEEE802.3af compliant class 2 powered device. Optionally, the HiPerCam V may also be supplied by 24 VDC over Ethernet without IEEE802.3af compliant negotiation allowing for much simpler power injectors. As an option, the HiPerCam V can be powered through a separate M12 connector with +24 VDC.

A wide selection of S-Mount/M12 lenses can be used in the HiPerCam V.

The hardware is designed to be deployed in industrial and mobile environments in temperature ranges between 0 and +55 °C and has no maintainable parts inside such as fans or batteries. The HiPerCam V is especially suited for use in rugged environments with regard to shock and vibration according to applicable DIN, EN or IEC industry standards.

The HiPerCam V firmware provides a comfortable management interface through http service. Besides global setup parameters the software allows the configuration of camera parameters such as resolution, frame rate, area of interest definition, etc. The standard version uses MJPEG for image transmission and HTTP for configuration. A host PC test application to display GigE images is also provided. Optionally, the camera can use H.264 compression protocol.

III Block Diagram



III Technical Data

CMOS Sensor

Optical format	1/2.7-inch (16:9)
Active image size	5.78 mm (H) x 3.26 (V), 7.13 mm diagonal
Active pixels	1920 H x 1080 V
Pixel size	3.0 μm
Frame rate	Up to 60 fps at full resolution HDR mode 16 bit -> 10 bit
Binning factors	1
ADC resolution	12-bit
Responsivity	4 V/lux-sec
Pixel dynamic range	96 dB max.
SNR _{MAX}	41 dB

Standards

- IEEE802.3u 100BaseTX
- IEEE 802.3ab for 1000BaseT
- IEEE 802.3af for Power-over-Ethernet
- GigE Vision Version 2.0 with 1 Gigabit

Physical Interfaces

LAN	10/100/1000BaseT(X) Port, M12 X-coded
Power in	M12, 4-pin A-coded (opt)
DVI-D out	FullHD image output

III Specification

Mechanical Specifications

HiPerCam V dimensions: 87 mm x 47 mm x 88 mm (whl)

Weight: 350 g, depends on lens

Electrical Specifications

PoE Class 2 powered device according to IEEE 802.3af

Environmental Conditions

Temperature range (operation): -30...+55 °C

Temperature range (storage): -40...+85 °C

Relative humidity (operation): max. 95 % non-condensing

Relative humidity (storage): max. 95 % non-condensing

Altitude: -300 m to + 2,000 m

Climatic tests according to EN 68068

Shock and vibration tested according to EN 61373



Standard Configurations

Article No.	CPU	Memory	Lens	Case	Sensor
HICAV-1000Vo	iMX6-Dual	256 MB	6 mm	IP 54	AR0230

Options

→ Protocols: H.264 encoded via TCP/IP

→ 2 GB DDR3 memory

→ Conformal coating

Related Products

→ HiPerCam I – Industrial digital camera

→ HiPerCam A – Waterproof outdoor camera

Accessories

→ Lenses are an integral part of the HiPerCam V and should be ordered with factory configuration. A wide selection of M-12/S-mount lenses is available. Standard focal length is 6 mm.

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