Smart and Freely Programmable

Open Source Camera Systems under Linux

eneo®

eneo SMART CAMERAS

Suitable for industrial needs with LINUX and open FPGA interface

The new eneo SC Series breaks new ground in the machine vision segment. These smart cameras fully suit industrial needs as they offer maximum flexibility: the optimised architecture on the Linux operating system in these very compact digital cameras allows standard industrial image processing software packages to be used. But tailored solutions can also be used for this camera with the powerful image processing API and a highly optimised toolchain.

The most forward-looking feature is the option of installing application-specific image preprocessing algorithms in the freely accessible Spartan-3 FPGA in order to keep processor computing power free for other tasks.

The colour and monochrome cameras with VGA resolution are available with a CS-mount connector – or – another highlight – with integrated optics and illumination, and can therefore be configured to other applications than those in automated production control. High-resolution cameras with 1280x1024 pixels are available in colour and monochrome versions with a CS-mount connection.

Its compact design (45x45x85 mm), low weight (approx. 184 g), extremely low power consumption of less than 2 Watts and the robust housing (protection rate up to IP67) allow integration into existing applications. Scan rates of 185 frames per second in full frame mode and a maximum 1000 frames per second in ROI mode (VGA model) cater for the high manufacturing speeds of modern factory automation machinery.

Several cameras can be networked and time synchronised over an Ethernet port. Direct transmission to the PLC is also possible over Ethernet, CAN bus (exclusive of SC-CVC 02 and SC-MVC 02) or simple switch contacts.

The cameras were developed for the rough environment of machine vision applications. As they are highly reliable and robust they can also be used in numerous applications beyond the field of automation.

Technology that impresses:

Compact design with integrated electronics for assessment of image data. Small dimensions and low weight allow simple integration into existing systems.

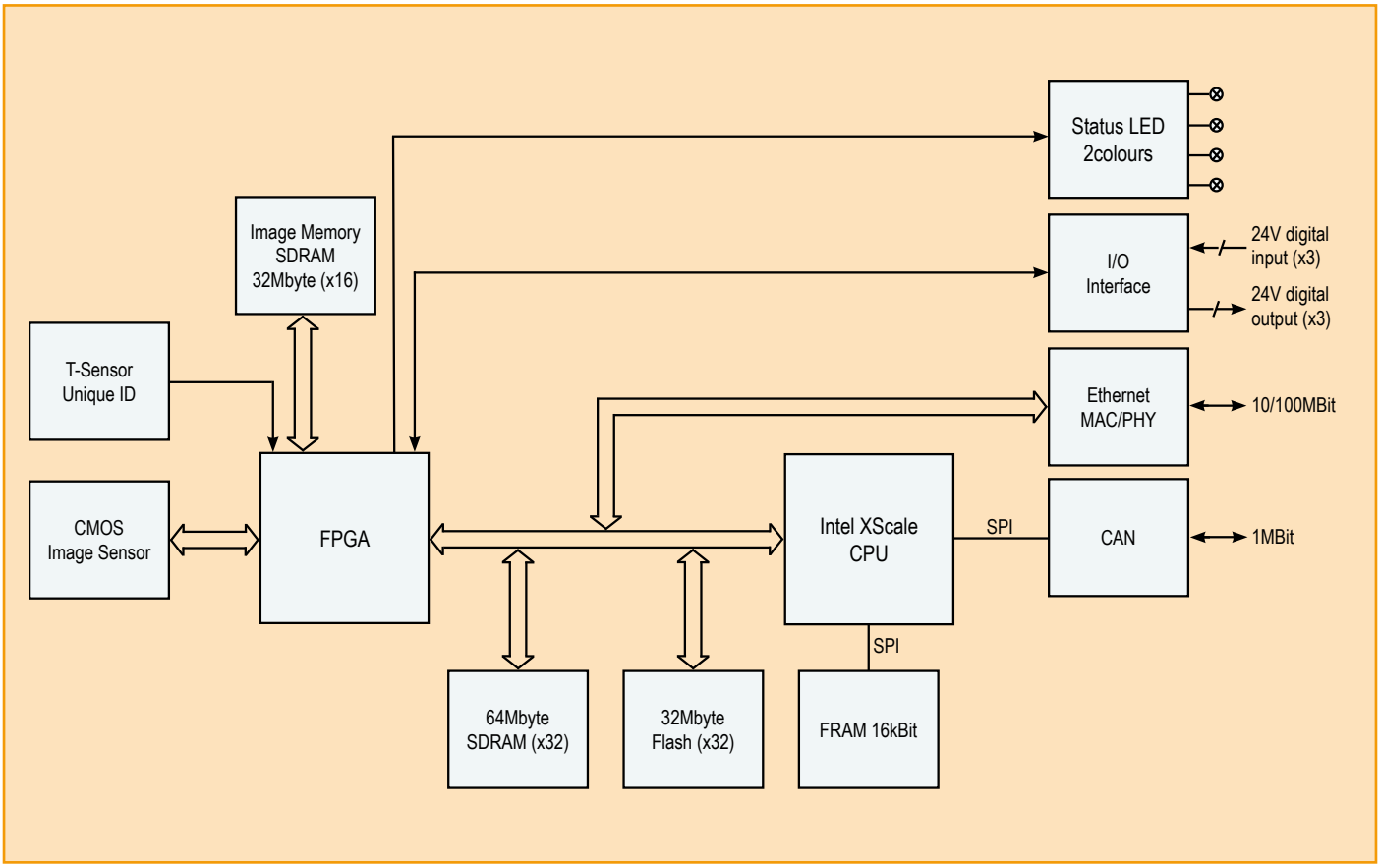
Performance that impresses:

Extremely high application-specific performance through access to hardware-related routines and option to optimise image preprocessing in the FPGA.

Freedom that impresses:

Open system architecture and freely accessible Linux operating system makes software applications expandable and interchangeable.

Block Circuit Diagram of the eneo SC Series



Highlights

- Easy Integration into Existing Systems
- Up to 185 fps at Full Resolution (VGA-Version)
- CMOS Sensor with Global Shutter
- Intel Xscale Processor with 400 MHz Clock
- 16 kBit non-volatile FRAM Memory
- Accessible Xilinx Spartan-3 FPGA
- Multiple Use of Software Solutions
- Access to Hardware Routines
- Very Compact Design
- Extremely Low Power Consumption
- Ethernet-Interface
- CAN-Interface (exclusive of SC-CVC 02 and SC-MVC 02)
- High Reliability
- Protection Rating up to IP67
- Standard Software Packages Available

Software Packages

VISUALAPPLETS

VisualApplets by Silicon Software is a graphic-oriented tool, which dramatically simplifies the programming of image pre-processing on FPGA hardware. With image pre-processing in the FPGA the resources of the main processor are kept free for other tasks.

HALCON

HALCON Embedded by MVTec is the comprehensive standard software library with an integrated development environment for machine vision. HALCON provides an extensive library of more than 1150 operators with outstanding performance as well as interfaces for the eneo smart cameras.

Accessories

Article-No.	Type	Description
59707	SC-ETH-CAB	Ethernet Connecting Cable 3m to RJ45
59708	SC-PWR-CAB	Cable for Power Supply and I/O with blank ends
59709	SC-TRIPOD	Tripod Adapter
59710	SC-LEN-CYL	Lens Protecting Cylinder
59711	SC-WED	Wedge Adapter
59712	SC-WED-GND	Wedge Adapter with Ground Plate

About eneo

The driving force behind this is Videor Technical, one of the major European distributors for professional video systems. Now we offer you the eneo product programme: one which profits from our 30 years of experience. Our strict quality assurance measures guarantee that all eneo products have the same high standard. The company-owned service centre ensures professional maintenance and smooth operation. And our computer-controlled warehouse together with our flexible, committed logistics team guarantee you optimal availability of the whole eneo programme.

Specifications SC-Series

Type	SC-CVC02 SC-MVC02	SC-CVC01 SC-MVC01	SC-CVL01 SC-MVL01	SC-CSC01 SC-MSC01
Article-No.	59728 59729	59701 59702	59705 59706	59703 59704
Sensor	1/3“ CMOS, Global Shutter	1/2“ CMOS, Global Shutter		2/3“ CMOS, Global Shutter
Resolution	752 x 480 Wide VGA	640 x 480 VGA		1280 x 1024 SXGA
Frame Rate	60 fps at 480 lines	185 fps at 480 lines up to 1397 fps at 64 lines		27 fps at 1024 lines up to 110 fps at 256 lines
Electronic shutter	51 µs to 32 ms	27 µs to 1 s		8 µs to 1 s
Lens mount	CS-Mount	CS-Mount	-	CS-Mount
Lens	-	-	f=12mm	-
CPU	Intel Xscale PXA255, 400 MHz			
Pre-Processing	Programmable Xilinx Spartan-3 FPGA			
SDK	Optimised Toolchain (also suited for floating point operations)			
Storage capacity	64 MByte SDRAM at CPU, 32 MByte SDRAM at FPGA			
Non-volatile memory	32 MByte Flash and 16kBit FRAM			
Ethernet interface	100BaseT, TCP/IP			
Bus-Interface	-	CAN-Bus max. 1 Mbit/s		
Inputs / Outputs	2 inputs / 3 outputs 24 V I/O			
Illumination	-	-	8 white LEDs	-
Supply voltage	24 VDC (+/- 10%)			
Current consumption	120 mA outputs unloaded			
Power consumption	1,9 W outputs unloaded			
Dimensions	45 x 45 x 85 mm (HxWxD)			
Operating Temperature	-10 to +50°C			
Vibration	According to DIN / IEC 68 / EN 60068 part 2-6. 0,35 mm distance at 10...60 Hz. 5 g acceleration at 60...150 Hz.			
Shock	According to DIN / IEC 68 / EN 60068 part 2-27. +/- 30 g at 11 ms duration. 5 shocks in each direction.			
Protection rating	IP65 and IP67 with Lens Protecting Cylinder (optional)	IP65 and IP67 with Lens Protecting Cylinder (optional)	IP65 and IP67	IP65 and IP67 with Lens Protecting Cylinder (optional)
Weight	174g	182g	184g	

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