

Messen

Prüfen

Kontrollieren

Sortieren

Positionieren

Vollständigkeitskontrolle

Vorhandenseinskontrolle

Oberflächeninspektion

Teileprüfung

Werkzeugvoreinstellung

3D Sehen

3D Erkennung

Robot Vision

Markierungskontrolle

Koplanarität

BGA-Prüfung

Konturprüfung

Fehler- und  
Verschmutzungserkennung

OCR / OCV

Zeichenerkennung

Code Lesen

Faden- und Stoffprüfung

Papier- und Folienprüfung

Metallprüfung

Displayprüfung LCD, LED,  
OLED

Mustervergleich

Blasenkontrolle

Robotersteuerung

Bohrer Vermessung

Thermografie

Plastik-Inspektion

2D

und vieles mehr...

## Product data:

# EyeCheck Thermo



## Description:

The intelligent thermal imaging camera – EyeCheck Thermo has a compact housing and a freely programmable FPGA. The integrated ZYNQ boards such as Raze1-30 are available for the user and their needs. One can choose between the two ZYNQ boards Raze1-15 and Raze1-30. Both ZYNQ boards have up to 1 GB DDR3L SDRAM and Gigabit Ethernet. A further speciality of the smart thermal imaging camera are the 8 in- and 8 outputs.

Of course there is also the EyeVision image processing included in the camera. Thanks to the drag-and-drop programming, even complex applications are easy to solve with the EyeVision Thermo command set.

Fields of applications are for example, packaging and filling machines, production, transport and storage of short-life food products.

Further application areas are in the automotive industry for monitoring the quality of crude steel, or in the cement industry for example for monitoring the capacity of the rotary kiln.

You can find more information on our website: [www.evt-web.com](http://www.evt-web.com).

Or call us for further information: **+49 (0) 721 668 004 23 0**

## Technical specification:

### The first IR smart camera contains:

- 8 In- and 8 Outputs
- interfaces GigE & RS232
- additional LVDS interface
- M12 connectors with IP65
- 2 x Micro-USB
- mini-PCI Express
- freely programmable FPGA
- integrated NUC shutter
- EyeVision image processing software with thermal imaging command set
- available resolutions and cameras:
  - \* EC Thermo 1000 with 640x480 pixel
- optional ZYNQ board:
  - \* Raze1-15 with 74k Logic Elements
  - \* Raze2-30 with 125k Logic Elements

### Technical Specification (EyeCheck Thermo camera data)

<b>Thermal Imager</b>	Uncooled microbolometer LWIR
<b>Spectral Band</b>	8 – 14 $\mu\text{m}$
<b>Array Resolution</b>	640 x 480 pixel
<b>Pixel Pitch</b>	17 $\mu\text{m}$
<b>Sensitivity (NETD)</b>	< 50 mK
<b>Frame Rates</b>	9 or 25 or 30 Hz
<b>Power Requirements</b>	1 W (typical), 6 – 15 Vdc
<b>Temperature</b>	-40 °C to +60°C operational, -40 °C to 80 °C storage
<b>Vibration</b>	20 Hz – 2 kHz, 0.1g <sup>2</sup> / Hz
<b>Shock</b>	50g half sine for a duration of 10 ms
<b>Interface</b>	1 x GigE, 1 x RS232 , digital: 8-In and 8-Out, 24V opto encoupled
<b>Connector</b>	M12 for all interfaces
<b>Dimensions</b>	LxBxH: 65 x 65 x 120 mm
<b>Lens</b>	8,5 mm / 19 mm / 25 mm focal length
<b>f/#</b>	1,2 / 1,2 / 1,2
<b>HfoV [deg]</b>	73,2 / 32,3 / 24,6
<b>VFoV [deg]</b>	54,4 / 24,5 / 18,5
<b>IFoV [mrad]</b>	2,0 / 0,9 / 0,68
<b>Focus</b>	Manual

## Raze1-15 & Raze1-30 ZYNQ board features

	Z-7015	Z-7030
<b>Processor Core</b>	Dual ARM Cortex A9 MPCore with CoreSight	
<b>Processor Extensions</b>	NEON & Single / Double Precision Floating Point for each processor	
<b>Maximum Frequency</b>	667 MHz (-1) – 766 MHz (-2)	667 MHz (-1) – 800 MHz (-2)
<b>L1 Cache</b>	32 KB Instruction, 32 KB Data per processor	
<b>L2 Cache</b>	512 KB	
<b>On-Chip Memory</b>	256 KB	
<b>External Memory Support</b>	DDR3, DDR3L, DDR2, LPDDR2	
<b>External Static Memory Support</b>	2x Quad-SPI, NAND, NOR	
<b>DMA Channels</b>	8 (4 dedicated to Programmable Logic)	
<b>Peripherals</b>	2x UART, 2x CAN 2.0B, 2x I2C, 2x SPI, 4x 32b GPIO	
<b>Peripherals w/ built-in DMA</b>	2x USB 2.0 (OTG), 2x Tri-mode Gigabit Ethernet, 2x SD/SDIO	

## Raze1-15 & Raze1-30 ZYNQ board all programmable SoC

	Z-7015	Z-7030
<b>Programmable Logic Cells</b>	74K Logic Cells	125K Logic Cells
<b>Look-Up Tables (LUTs)</b>	46,200	78,600
<b>Flip-Flops</b>	92,400	157,200
<b>Extensible Block RAM</b>	380 KB	1,060 KB

## Absolute maximum ratings

Parameter	Value			Unit
	Min.	Typ.	Max.	
VCC	10.5		28	V
I <sub>s</sub> Supply current @ VCC Max.			1	A

Parameter	Value			Unit
	Min.	Typ.	Max.	
V <sub>IO</sub>			VCC	V
V <sub>USD</sub> Undervoltage shutdown	7		10.5	mA
R <sub>ON</sub> On-state resistance	150		280	mΩ
I (all channels ON)	0.15		12	mA
I <sub>LGND</sub> Output current at turn-off			1	mA
I <sub>L(off)</sub> Off-state output current	0		5	μA
V <sub>OUT(off)</sub> Off-state output voltage			3	V
-I <sub>GND</sub> DC ground pin reverse current	-250			mA
I <sub>OUT</sub> DC output current (internally limited)	1.7			A
-I <sub>OUT</sub> Reverse DC output current	-2			A

### Switching output

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
$t_{ON}$	Turn-on time	$R_L = 48 \Omega$ from 80% $V_{OUT}$	-	50	100	$\mu s$
$t_{OFF}$	Turn-off time	$R_L = 48 \Omega$ to 10% $V_{OUT}$	-	75	100	$\mu s$
$dV_{OUT}/dt(on)$	Turn-on voltage slope	$R_L = 48 \Omega$ from $V_{OUT} = 2.4 V$ to $V_{OUT} = 19.2 V$	-	0.7		$V/\mu s$
$dV_{OUT}/dt(off)$	Turn-off voltage slope	$R_L = 48 \Omega$ from $V_{OUT} = 21.6 V$ to $V_{OUT} = 2.4 V$	-	1.5		$V/\mu s$

### Input characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$V_{IN(off)}$		0		5	V
$V_{IN(on)}$		7	12	3	

### M12 IO and RS232

Pin	Connector		Cablecolor
	A	B	
1	OUT4	OUT0	BN
2	OUT5	OUT1	BU
3	OUT6	OUT2	WH
4	TX RS232	V+	GN
5	OUT7	OUT3	PK
6	IN4	IN0	YE
7	IN5	IN1	BK
8	GND	GND	GY
9	IN6	IN2	RD
10	IN7	IN3	VT
11	RX RS232	V+	GYPK
12	GND	GND	RDBU

