

EyeSorter Checkbox

JeSorte

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1. System description

After assembly, the user can teach the system to a good component at the touch of a button. All subsequent components for the taught-in component are then checked. The result is shown on the display and is immediately available for controlling actuators via I/O interfaces.

The *EyeSorter Checkbox* can be integrated into any system via the integrated I/O interfaces.

2. Display

2.1 Menu structure

This is the menu structure

	Idle	This is the main screen.	Part: 2 AUTO
AUTO	Process mode	Execute the proess mode: The trained part will be processed. The template is displayed on the display screen. The round LED on the bottom indicates the previous inspection result. Counters are displayed on the right site of the display. Pressing the STOP button will	Processmode running STOP Counter Good: 0 Bad: 0 Turn: 0 Total: 0



		abort the inspection and return to idle.	
(\$	Training mode	Execute the training mode: User will be asked to place a part. After it has been recognized, the simplified part will be displayed. User is asked to confirm as the part has been scanned. The training can be aborted.	Train New Part
Y X	Calibration mode	Execute the calibration mode: User will be asked to place the calibartion part. Calibration part: Metal part with 5 mm hole.	Calibration
¢	Settings	Enter the settings menu.	Settings Part ID: 2 Coo



	Settings Select part	Here one of five parts can be selected. After leaving the menu, all operations (training and execution) will be executed for this part ID.	Select Part
¢	Settings Parameters	In this menu Reset the counters	Parameters
	Settings Parameters Params GOOD	Set the distance (in encoder ticks) and the duration (in ms) for the signal after detection of a good part. The commission counter limit can also be set in this menu.	Params GOOD
		Set the distance (in encoder ticks) and the duration (in ms) for the signal after detection of a bad part.	Params BAD



		Set the distance (in encoder ticks) and the duration (in ms) for the signal after detection of a turn part.	Params TURN
Adjust Camera	Adjust camera	Execute the "Adjust camera" program. Adjust camera helps to adjust the position in y (and x if required.): The scanner sends the image of the camera to an EyeView instance. Modify the parameters CenterX and BottomY.	Adjust Camera OK Center Y 514 Bottom Line 32



3. Interface

3.1 Front panel



The system has 4 connectors that provide the following functions:

- Power: 24 V (PWR)
- Ethernet (ETH)
- Digital I/O: 4 inputs, 5 outputs (I/O)
- Encoder interface (Encoder)
- Status LEDs
- The display can be used to setup the system.



3.2 Power supply



24V, 5 Ampere

Mindestleistung 120 Watt Spannung 24V

Pinbelegung	Color	
1	white	+24V
2	brown	GND
3	green	GND
4	yellow	+24V
5	grey	

Please connect as well GND and 24V, each cable together.

3.3 Ethernet

The system has an ethernet adaper and provides the following services:

- Webinterface for maintainance
- *EyeVision* remote interface (only for support purpose with EVT)
- ssh, openvpn (only for support purpose with EVT)

Service	Port		
ssh	22		
EyeVision Remote interface	1998		
webserver	5000(8080)		
vnc	5900	realvnc	



3.3.1 IP Adresse

The system is shipped with IP 192.168.1.55. Please use a GenICam GenCP tool to configure the IP Adresse.

	💰 IPConfigurator – 🗆 🗙				
Evel/ision/ / 000 Win6/		User Defined Name Serial Number	Device Info		
	✓ Intel(R) Ethernet Connection (4) I219-V		Device User Defined Name	:N/A	
E Fuel/Gent	EyeSorter	12345678 1	Device Model:	N/A	
Neu	inter(R) Duar band wireless-AC 6203		Device Serial Number:	N/A	
			Device Manufacturer:	N/A	
🥌 EyeVision			Device IP:	N/A	
EveVision Remote			Device Subnet Mask:	N/A	
Neu			Device MAC Address:	N/A	
HardwareConfigurator				Local Link Area (LLA)	
Neu 🔤				DHCP	
4. IPConfigurator				Static Address	
🗢 Neu			Interface Info		
			Interface Name:	Intel(R) Ethernet Connection (4) I219-V	
			Interface ID:	{8498E9CE-031B-401B-823C-5761053ED05E}	
			Interface Subnet Index:	192.168.2.29/24 ~	
	<	>	Interface Subnet IP:	192.168.2.29	
	Update	Assign temp. IP Assign persistent IP	Interface Subnet Mask:	255.255.255.0	
	Search devices on interface Intel(R) Ethernet	Connection (4) I219-V		^	
	Found interface Intel(R) Dual Band Wireless-	AC 8265			
	Search devices on interface Intel(R) Dual Ban	d Wireless-AC 8265		v	

3.4 Webinterface for maintenance







3.5 Encoder

The encoder has three differential inputs A, B and Z. Each receiver features a wide common-mode input range of -20V to +20V. All receiver inputs are fault-protected against voltage shorts in the ±40V range. Per-channel fault detection provides warning of irregular conditions, such as short circuits and open connections.

Minimal voltage: +- 3V

Maximal voltage: +- 24V

Maximal frequency: 5MHz

The system is only using encoder inputs A and B.

3.5.1 Encoder cable



Pin	Color	Function	Remarks
1	white	Enc A+	Encoder Input A positive
2	brown	Enc A-	Encoder Input A negative
3	green	Enc B+	Encoder Input B positive
4	yellow	Enc Z+	Not used yet
5	gray	Enc Z-	Not used yet
6	pink	Enc B-	Encoder Input B negative
7	blue		
8	red		



3.5.2 Integrated Protection

Integrated Protection Ensures Robust Communication ±40V Fault Protection Range ±20V Common Mode Range ±25kV HBM ESD ±7kV Air-Gap IEC 61000-4-2 ESD ±10kV Contact IEC 61000-4-2 ESD -40°C to +125°C Operating Temperature Range

3.5.3 Block Diagram Encoder Input





3.5.4 Electrical Characteristics

Electrical Characteristics

(V_{CC} = 5V±10%, V_L = 1.62V to V_{CC}, T_A = -40°C to +125°C, unless otherwise noted. Typical values are at V_{CC} = 5V, V_L = 3.3V, T_A = +25°C.) (Notes 2, 3)

PARAMETER	SYMBOL	CONE	DITIONS	MIN	TYP	MAX	UNITS	
RS-485/RS-422 RECEIVERS (Rx	A, RxB, RxZ, R	xY)		·				
Differential Threshold Voltage	VTH	-20∨ ≤ ∨ _{CM} ≤ +20∨		-200		+200	m∨	
Differential Input Hysteresis	ΔV_{TH}	-20∨ ≤ ∨ _{CM} ≤ +20∨			230		m∨	
			V _{IN} = -10V	-270	-170			
Single-Ended Input Current	IN	$v_{CC} = 0v \text{ or } 5v$	V _{IN} = +10∨		+100	+160	μΑ	
Low Differential Voltage Fault	V _{TH_DFP}	-20∨ ≤ ∨ _{CM} ≤ +20∨,	positive	+270		+460		
Threshold	VTH_DFN	$-20 \lor \le \lor_{CM} \le +20 \lor$, negative		-460		-270	mv	
	1			1			1	
Single-Ended Input Fault	VTH_SELP	Positive		+15		+18	V	
Threshold	V _{TH_SELN}	Negative		-18		-15	v	
PROTECTION								
Thermal-Shutdown Threshold	T _{SHDN}	Temperature rising			+160		°C	
Thermal-Shutdown Hysteresis	T _{HYST}				10		°C	
Fault-Protected Input Voltage Range (A, Ā, B, Ē, Z, Z, Y, Y)	V _{IN_F}			-40		+40	V	
		IEC 61000-4-2 air-ga	ap discharge to GND		±7			
ESD Protection		IEC 61000-4-2 contact discharge to GND			±10		kV	
(n, n, b, b, z, z, bii, i)		Human Body Model			±25			
ESD Protection (All Other Pins)		Human Body Model			±2		kV	



3.5.5 Test Circuits and Waveforms









3.6 Digital inputs and output signals



3.6.1 Digital inputs

The system has the following input signals:

Inputs	Pin	Color	Value	Signal
Common	8	gray		
0	9	red	5V to 24V	Reset counters
1	10	blue-red	5V to 24V	digital
2	11	purple	5V to 24V	digital
3	12	gray-pink	5V to 24V	digital

Inputs can be used positive or negative: COM can be either connected to GND or to VIO.





Schaubild 1: Example how to use negative input



Schaubild 2: Example how to use positive input

3.6.2 Digital outputs

Output	Pin	Color	Value	Signal
DIO GND	1	brown	GND	
VIO	2	blue	5V to 24V	
0	3	white		GOOD
1	4	green		BAD
2	5	pink		TURN
3	6	yellow		Counter limit reached
4	7	black		N/C





Schaubild 3: Output circuit

4. Parameter description

Parameter name	Description	Value range	Remarks		
Adjust Camera adjustment					
CenterX	Center of the illumination	02048	Center of the illumination		
BottomY	Bottom of the inspection	0255 (Stepsize: 16)	Asure to avoid to see the conveyor belt		
EncoderTicksPerMilimeter	Number of Ticks per milimeter	32bit signed			
Vision parameters					
Exposure time	Exposure time in us		Typically 100 us		
Configuration of the flying trigger					
OutOKDistance	Distance to the expulsion of good parts	32bit signed	Encoder ticks (to be done mm)		
OutOKDuration	Duration of the output signal in miliseconds				
OutNOKDistance	Distance to the expulsion of bad parts	32bit signed	Encoder ticks (to be done mm)		



	for rejection			
OutNOKDuration	Duration of the NOK output signal in miliseconds			
OutTURNDistance	Distance to the expulsion of rotated parts for rejection	32bit signed	Encoder ticks (to be done mm)	
OutTURNDuration	Duration of the TURN output signal in miliseconds			
00 ⁹ Counter				
Use commission counter	Activates the commission counter	0,1		
Counter limit OK		32 bit signed	A negative value will ignore OK count for commission counting	
Counter limit NOK		32 bit signed	A negative value will ignore NOK count for commission counting	
Counter limit TURN		32 bit signed	A negative value will ignore TURN count for commission counting	
Additional settings				
ImageTransferIPAdresse				





5. Setup

5.1 Direction of the conveyor







- 5.2 Electrical connection
- 5.3 Mounting

5.4 Adjusting the camera

Web interface adjust camera



Adjust exposure time and position of the cross.

5.5 Calibration

- Start with a very small encoder divider and increase the encoder divider to get no overtrigger.
- As soon as there is no overtriggering, you can start the calibration.
- Place the calibration part and determine the "SliceWidth" parameter.

5.6 Training