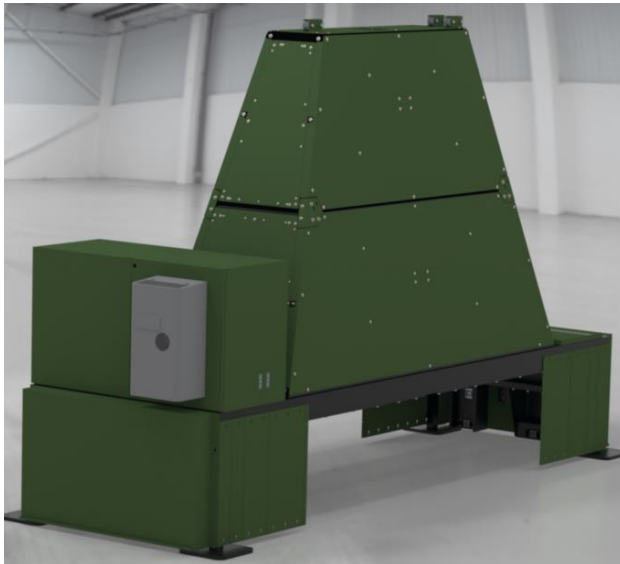


## OCAS (Over Conveyor Analysis System)

OCAS is the versatile machine vision platform upon which our bespoke industrial solutions are implemented. These solutions are tailored in house to meet specific client requirements by our experienced team of optical, hardware and image processing engineers.



The unit is installed over a production line to provide live, in-process quality assurance (QA). It uses a variety of cameras and eye safe illuminators which perform thermal, 3D and visible surface inspection to locate defects. OCAS can detect and classify defects on multiple surfaces, quantifying them by size and severity. Results are reported through an intuitive user interface accessible over a local network to provide instant feedback to personnel. This allows more responsive quality control and facilitates lean manufacturing workflows by reducing non-value-added time. OCAS enhances the ability to control production processes optimally, reduce wastage, and minimise production

times and costs. Solutions built on this platform are proven across Europe with systems developed and deployed for major organisations.

We provide full design, development, manufacturing, installation and support services for our systems.

### OCAS Features:

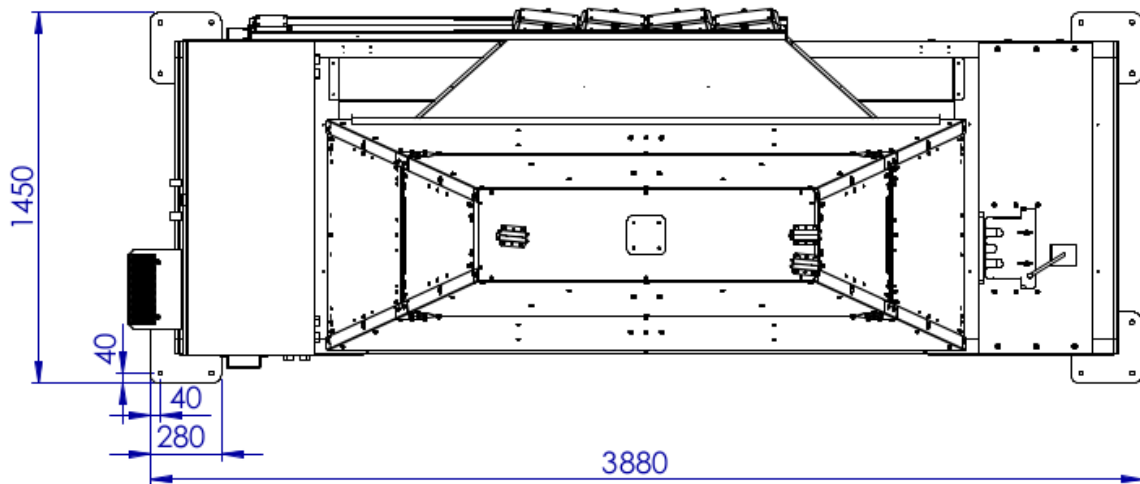
- OCAS will analyse production in 3D.
- Detect upper & edge surface deformations.
- Detect and optionally classify visible defects.
- Quantifies defects by size & severity.
- Applies user defined control parameters to generate good/not good decisions.
- Neural net based classification trained using samples audited by experienced personnel.
- Can be integrated with the production line control system.
- Can be employed to automatically reject defective product.
- Can log analysis results for audit purposes.
- Can operate 24/7 over extended periods of time.
- All active components are accessible and serviceable without requiring production line stops.

Machine Vision  
OCAS and Integrated Inspection Camera  
Application Note

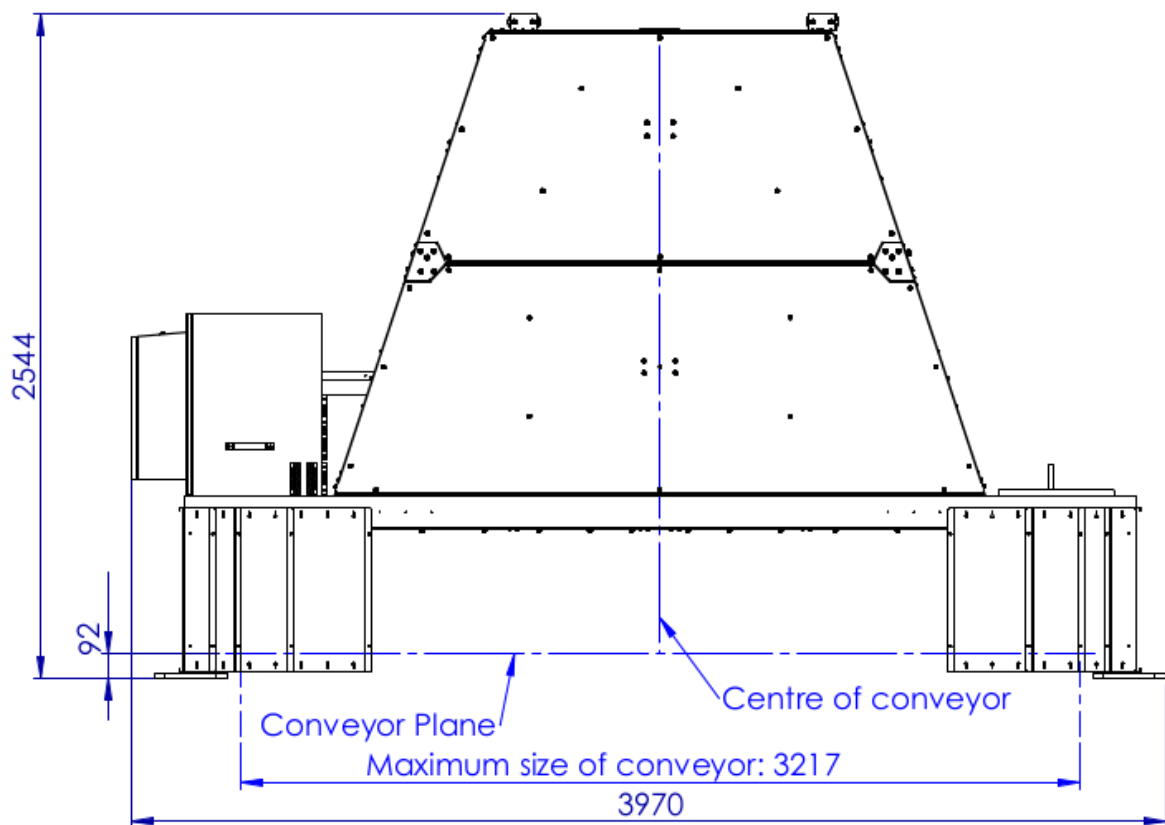


OCAS Specification:

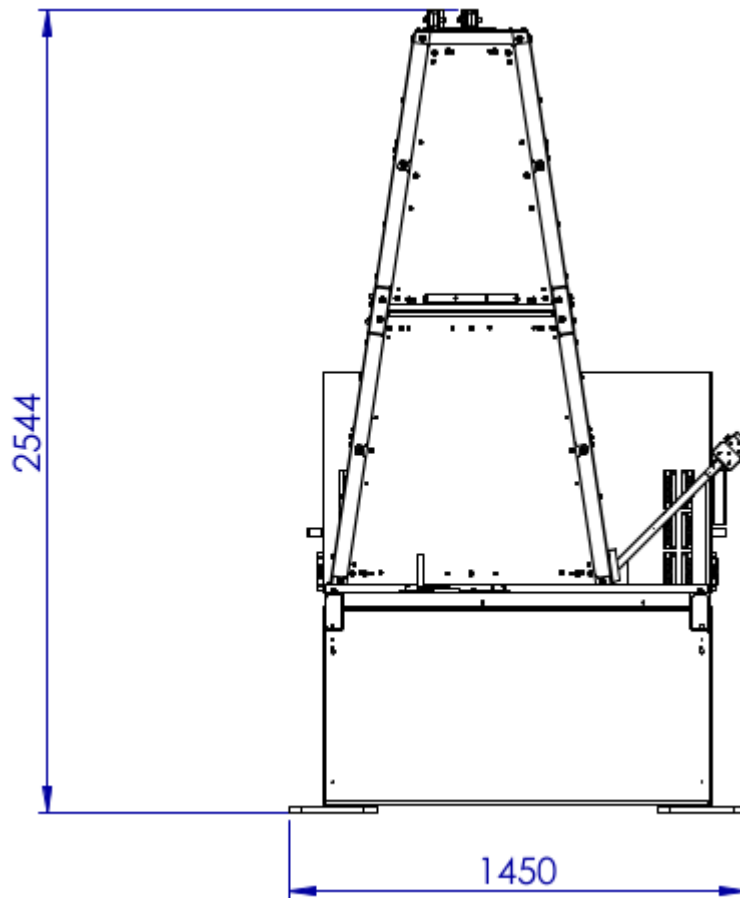
Physical Dimensions (+/- 1mm)



Top view of OCAS

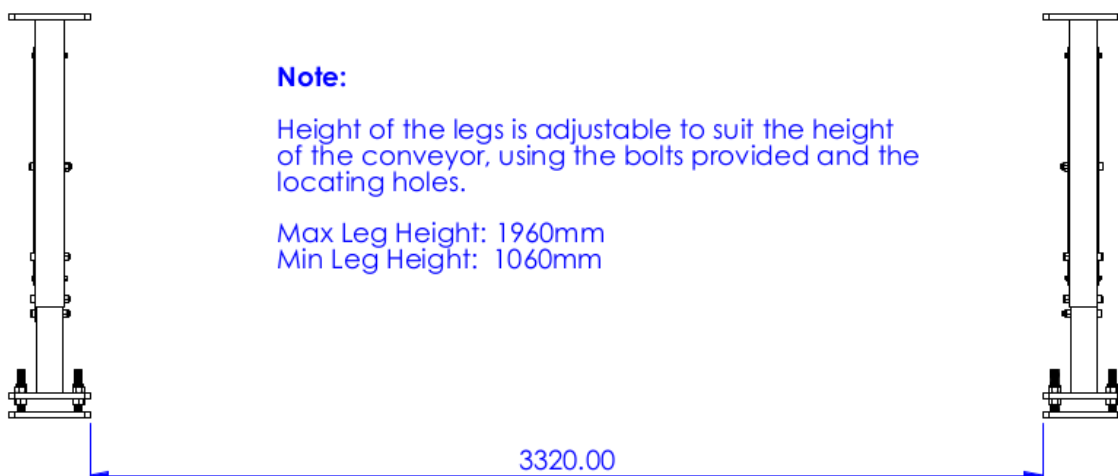


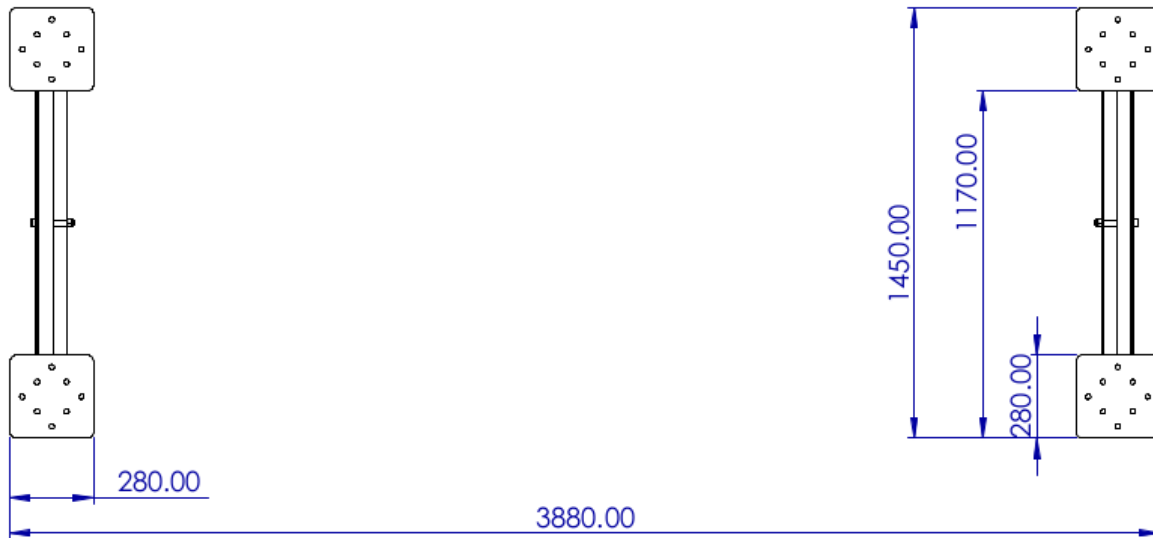
Front View of OCAS



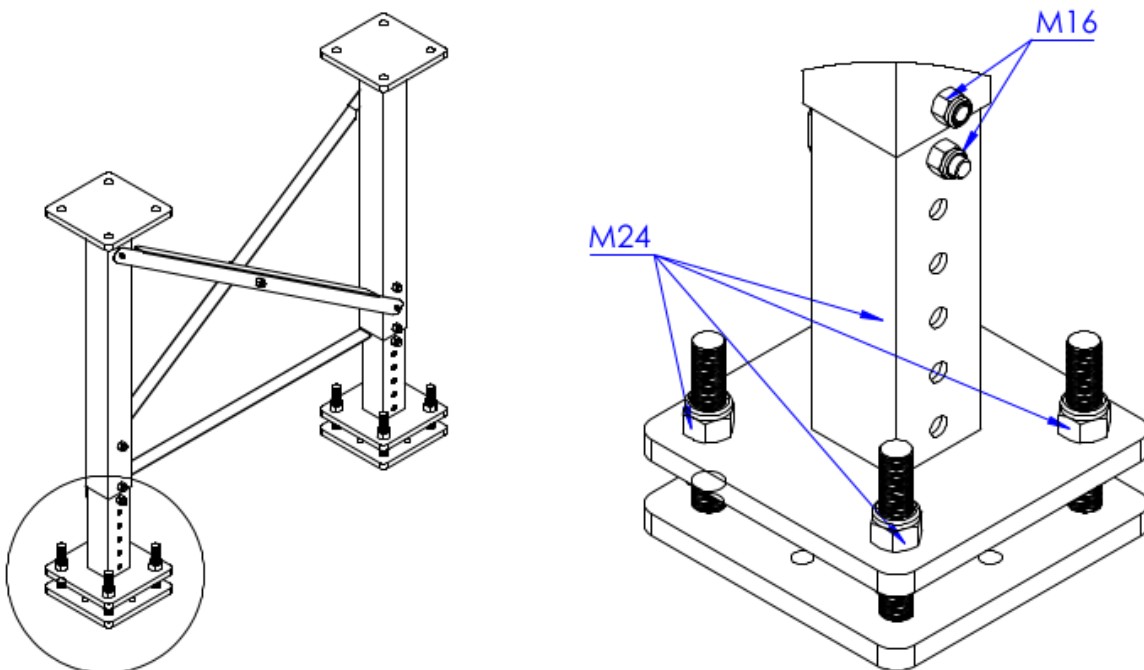
Side View of OCAS

OCAS is supplied on legs which extend directly down from the footplates shown to fixing points on the floor. Floor fixings fit within the footprint of OCAS as shown. The legs are adjustable to allow OCAS to be positioned at the correct height relative to the surface of the conveyor plane.





Top View of OCAS Mounting Legs



Isometric view of the mounting legs showing adjustment bolts.

Leg footplates are welded or bolted to a suitable mounting surface (typically the floor). The complete system weighs no more than 1200Kg. The mounting surface should be stable and capable of supporting this weight.

# Machine Vision

## OCAS and Integrated Inspection Camera

### Application Note



#### Production Line Specification

Parameter	Min	Max	Notes
Conveyor speed	0.00 m/s	0.83 m/s	Speed under OCAS. Analysis automatically suspends when the conveyor is stationary.
Conveyor height	1250mm	1750mm	Height measured from leg footplate mounting surface
Clearance over conveyor	2500mm		Clearance required at installation may exceed this to allow lifting of the system
Conveyor width		3210mm	Includes external (stationary) frame in addition to conveyor bed width.
Production width		2500mm	Width of analysis region (region where product can be analysed). Analysis region must be centred under OCAS.
Production height	20mm	350mm	Measured from conveyor surface
Maximum over-height production		475mm	Measured from conveyor surface. Assumes maximum width production.

#### Environmental Conditions

	Minimum	Maximum	Notes
Storage Temperature	-10 °C	40 °C	Temperature changes should be minimised
Storage Humidity	30%	60%	Non-condensing environment Humidity changes should be minimised
Other storage Requirements	Store in a low dust environment. Store away from sources of vibration such as heavy machinery.		
Startup Temperature	10 °C	40 °C	
Operating Temperature	0 °C	50 °C	

# Machine Vision OCAS and Integrated Inspection Camera Application Note



## Connections

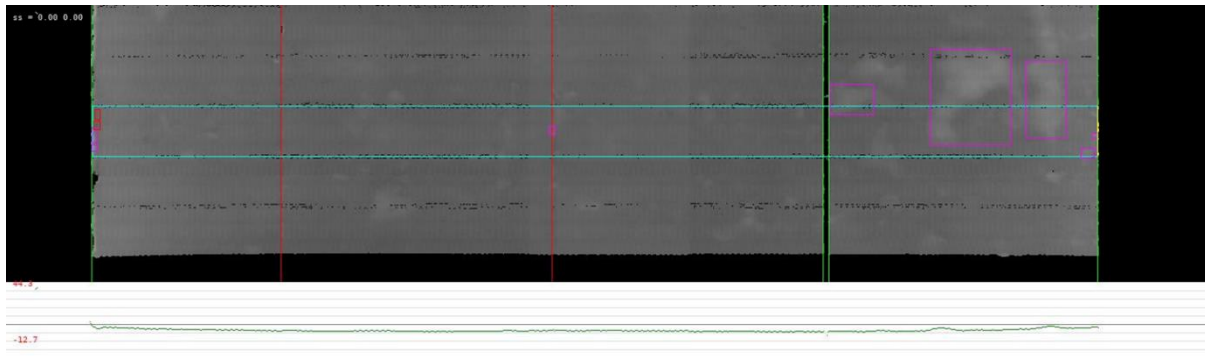
Input	Specification	Notes	Connection Point	Connection Type
Power Supply	220-240 V (AC) 50 - 60 Hz 6 A		Server cabinet	Hardwire
Air Supply	10 bar max, 5 bar min 6 bar nominal	Instrument air. Air must be clean and filtered. Internal distribution max 6 bar. Typical consumption estimated to be 66 l/min	Air distribution panel	8mm OD 6mm ID Pushfit pipe
Network	100Mb Ethernet or faster. over Cat5e (minimum)		Server cabinet	RJ45

# Machine Vision OCAS and Integrated Inspection Camera Application Note

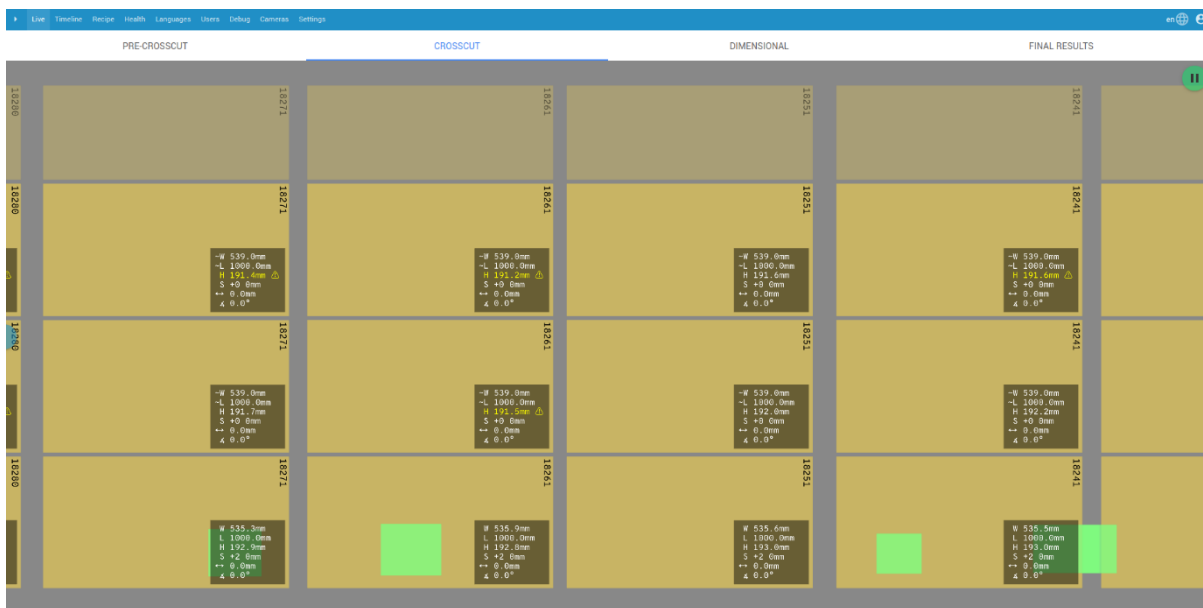


## OCAS Working Examples

The following are illustrative examples from current OCAS installations.



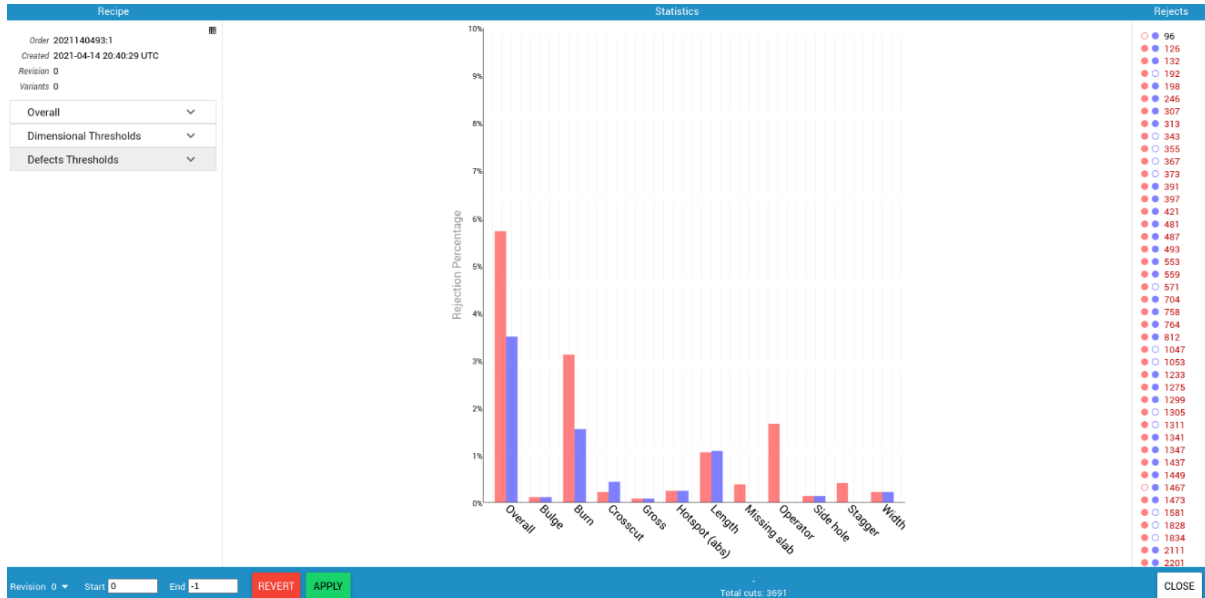
*Top surface depth map analysis*



*A customised interface showing detected and classified defects on a live production line.*



# Machine Vision OCAS and Integrated Inspection Camera Application Note

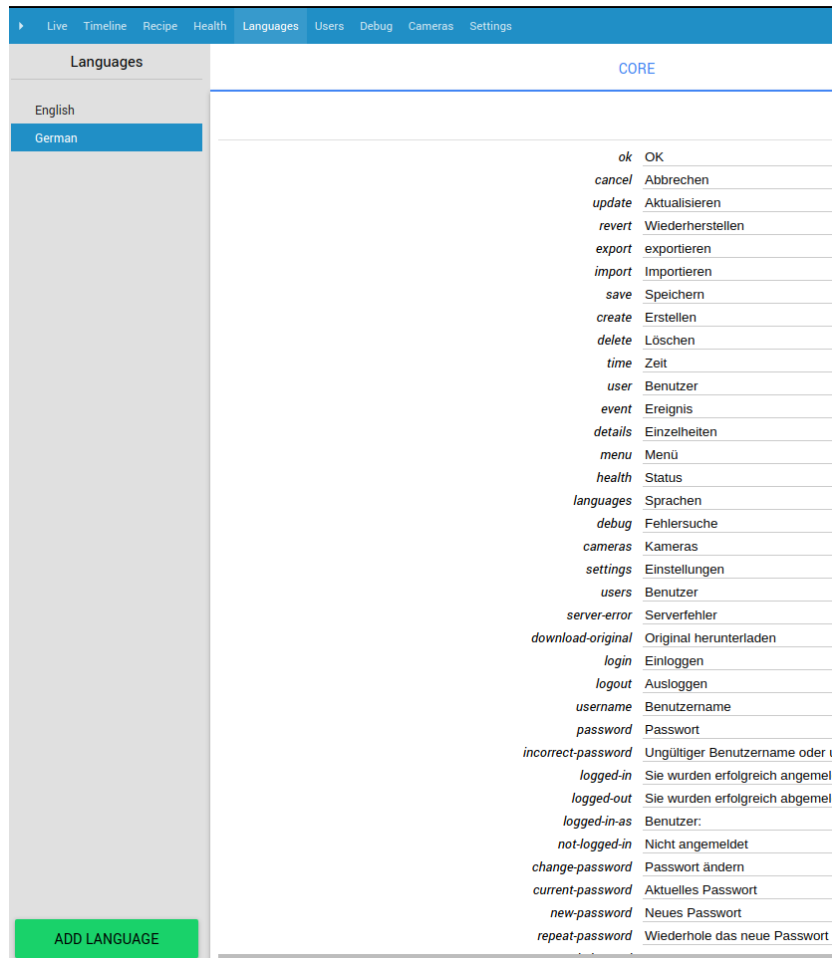


*Re-analysis of logged results to allow the testing of alternative control parameters.*

Logs	Time	User	Event	Details
2020-09				recipe 35084419.0
2019-04				revision 1
2019-05	2020-03-18 09:57:41	Ralf	recipe.update	change defects.bulge.size.reject from 20000 to 0 change defects.bulge.threshold.alarm from 0.6 to 3 change defects.bulge.threshold.reject from 7 to 0 change defects.burn.size.reject from 2000 to 2250 change defects.burn.threshold.reject from 0.65 to 0.6 change defects.crosscut.size.reject from 2000 to 2250 change defects.crosscut.threshold.reject from 0.5 to 0.6 change defects.fold.threshold.alarm from 5 to 0.9 change defects.hotspotAbsolute.threshold.reject from 85 to 75
2021-02				id 2
2020-07				type defects
2019-10				change bulge.size.reject from 20000 to 0 change bulge.threshold.alarm from 0.6 to 3 change bulge.threshold.reject from 7 to 0 change burn.size.reject from 2000 to 2250 change burn.threshold.reject from 0.65 to 0.6 change crosscut.size.reject from 2000 to 2250 change crosscut.threshold.reject from 0.5 to 0.6 change fold.threshold.alarm from 5 to 0.9 change gross.size.reject from 40000 to 0 change hotspotAbsolute.threshold.reject from 85 to 75
2020-04	2020-03-18 10:00:21	Ralf	db.update	id 2
2020-01				type defects
2018-09				change crosscut.size.reject from 2000 to 2250
2019-11	2020-03-18 10:00:53	Ralf	db.update	id 2
2020-02				type defects
2021-04	2020-03-18 10:02:54	Ralf	db.update	id 2
2019-12				type defects
2019-03				type defects

*User access controls and activity logging*

# Machine Vision OCAS and Integrated Inspection Camera Application Note



*Custom interface localisation.*

## Integrated Inspection Camera (IIC)



IIC is an integrated image capture system featuring high intensity pulsed illumination and advanced camera technology to prevent motion blur and image distortion. It is available with visible or near infrared lighting (NIR) options and provides compact image capture capabilities for inspection systems.

The NIR configuration is ideal for applications operating in the same area as personnel. Since the lighting is invisible to the eye, high pulse intensities can be employed with no impact on human operators. The intensity and short duration of the pulses eliminates the effects of ambient light for many applications.

The visible light variant provides controlled white light for colour analysis. The IIC is available with a wide range lenses allowing the system to be optimised for specific applications.

The system is low power, with the illumination running from 21.5V DC, 4A supply in and the camera supplied by a USB 2.0/3.0 host interface. The camera is capable of full frame capture at over 30 fps<sup>1</sup>. The camera features a watchdog which can optionally reset the camera after a period of inactivity. The system is designed for durability and unattended 24/7 operation.

The IIC is compatible with VESA wall mounts up to 100mm x 100mm and 1/4" x 20 UNC (standard camera mount fixture connection). It is lightweight, compact and constructed with a robust dry powder coated finish.

An optional RS485 connection is available for configuration and monitoring of the illumination sub-system.

The unit is designed for integration with products based on the OCAS platform.

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<sup>1</sup> USB 3.0 only  
Revision 1.2 April 2021



IIC Specifications

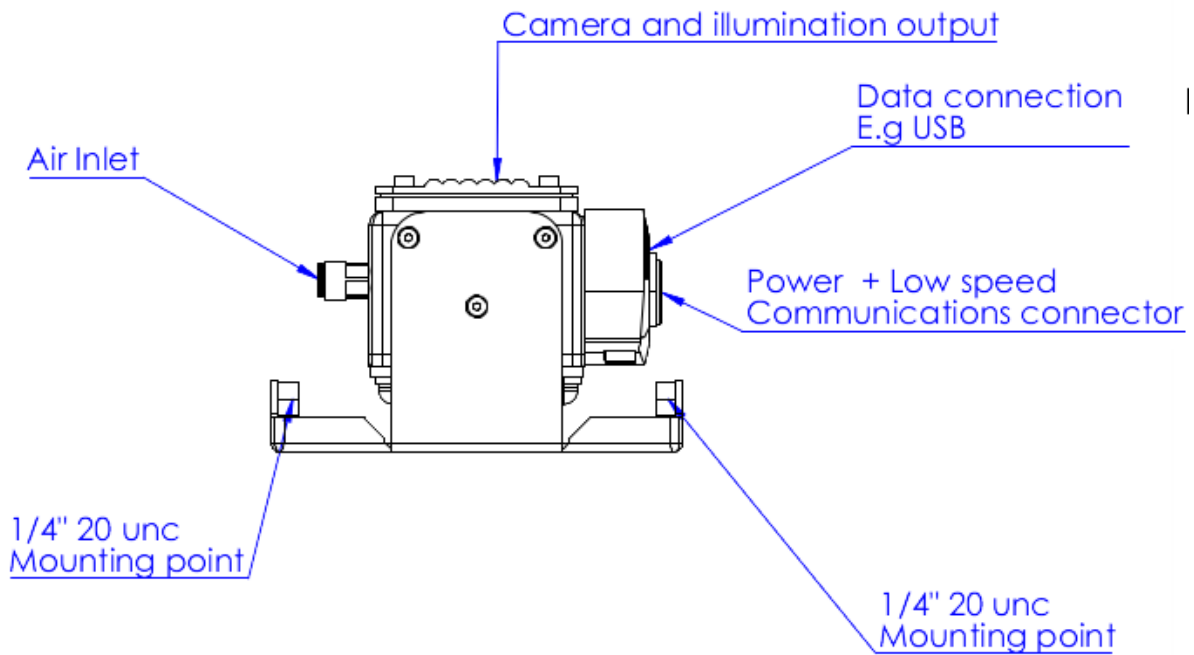
Property		Specification	Notes
Weight		1.3Kg	
Mounting Options	VESA	75 x 75 (M4 thread) 100 x 100 (M4 thread) 75 x 50 (M4 thread) 100 x 50 (M4 thread)	Rear
	Camera Mount	1 x ¼" x 20 UNC thread	Rear, Top, Bottom
Cabling	Unit to Junction Box or host (power and signal)	3m max length	Cables Included
	<b>If connecting to OCAS or extending cabling from a junction box</b>		
	OCAS - Junction Box (ethernet)	50m max length Cat 5e/6 RJ45 connectors	Must be Power over Ethernet (PoE) compliant
	OCAS - Junction Box (power)	50m max length 2 core 2.5mm <sup>2</sup> CSA	
	OCAS - Junction Box (signals)	50m max length 0.2 - 0.5mm <sup>2</sup> CSA	Twisted pair with screen
Power		21.5V DC	
Mounting Angle		55° Max 35° Min	Angle to horizontal. It is recommended that this is adjustable.

*Installation properties*

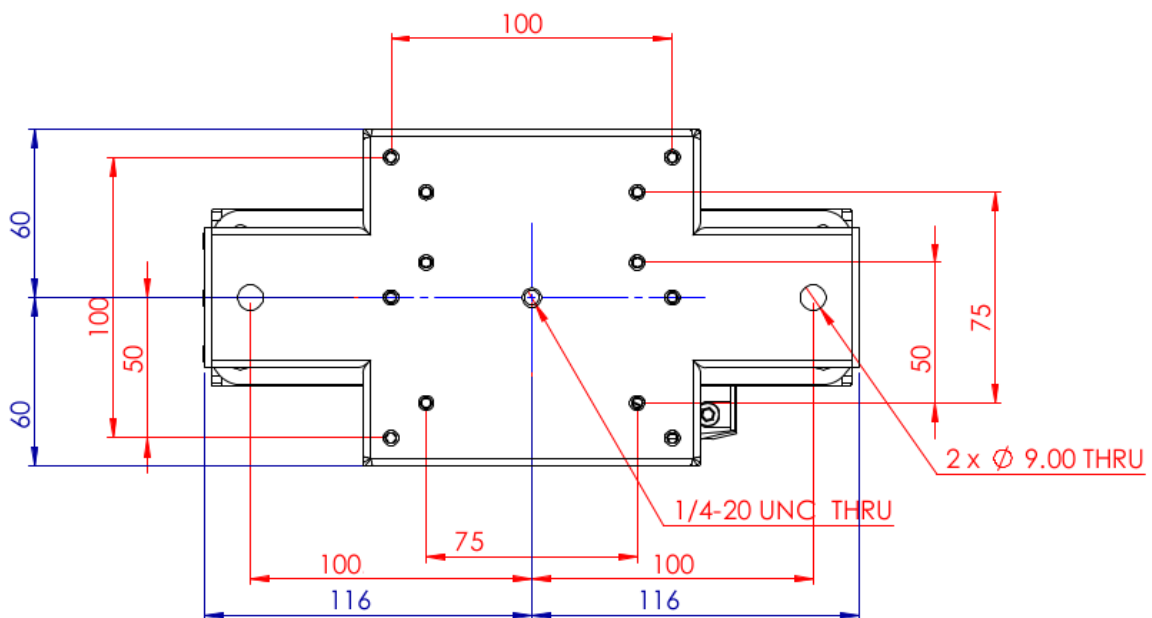
# Machine Vision OCAS and Integrated Inspection Camera Application Note



Physical Dimensions (+/- 1mm)



Connection and Mounting Points  
Top View



Rear View Showing Mounting Points

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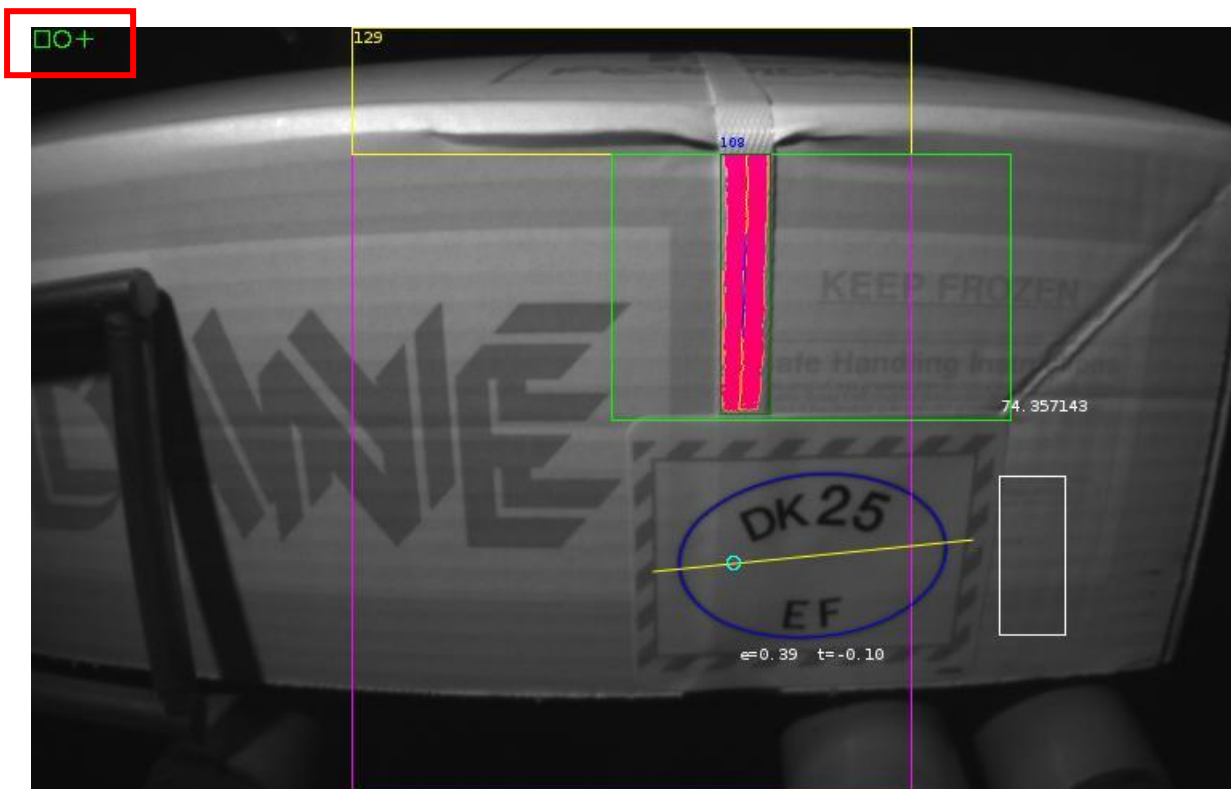
OCAS Partners:



## Case Study

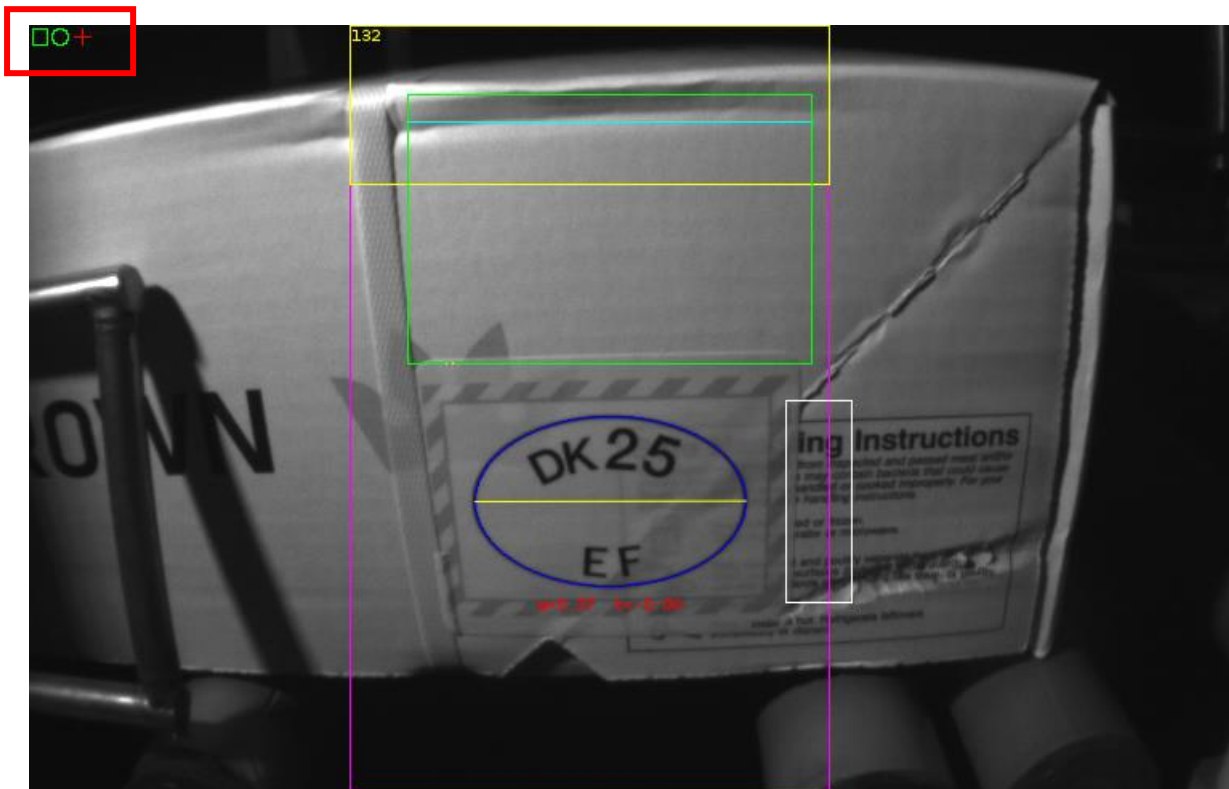
An analysis system was created using OCAS components to determine packaging conformance. The client required a system to ensure all boxes of a specific type were sealed with a packing strap correctly covered by a packing label to meet export requirements.

Boxes pass the inspection point at high speed. The system is required to automatically divert incorrectly packaged items for rectification without impacting throughput.



*Image 1: Detection of correct packaging*

In image 1 the system has detected the box, verified the type, confirmed the packing label is present and correctly covers the packing strap.



*Image 2: Detection of incorrect packaging*

In Image 2 the system has once again detected the box, verified the type and confirmed the packing label is present. However, the system has detected that no packing strap is present under the label. This box is identified as non-conformant and redirected for remedial action.

The quality checks can be seen graphically within the red boxes on both image 1 and 2. A green icon highlights a pass and a red icon highlights a failure. The system emits a pass/fail signal over MODBUS which triggers redirection of incorrectly packaged boxes.

The application did not require a full OCAS and could therefore be implemented using the Integrated Inspection Camera.

# Machine Vision OCAS and Integrated Inspection Camera Application Note



## Contact Us

For further information on our machine vision industrial solutions please feel free to contact us. This can be done through our website at <https://www.perception-si.com/contact-us>

Alternative you can call us on +44 (0) 1302 729126.

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