



DATA SHEET

KIARA COUNTING SYSTEMS

Al Vision facilitates speedy packaging and inventory control by minimizing counting and batching errors.

KCS Overview

Current methods, like weighing, manual counting and sensor-based counting have restrictions related to part shapes, speeds, and precision. Kiara Counting Systems (KCS) uses cameras and AI to count objects in images accurately and at high speeds.

Concept:

To employ AI to identify and count objects in images.

Neural networks can become intelligent by observing examples of things. As more data is entered, the system's accuracy improves.

Image Capturing Scenarios

KCS-CT: Camera mounted on the conveyer top.

The camera tracks and counts objects on the conveyer as they pass by



KCS-G98: Count in the air

Using high-speed cameras and lights in a falling objects chamber, images are captured to identify and count the objects going through.



KCS TT: Camera mounted on tabletop

A stationary setup allows the camera to identify and count the objects seen from the top.



KCS Software Suite

The Software Suite is the heart of KCS, as it allows for fast and accurate counting of parts. Cameras capture images which are then identified, tracked, and integrated with industrial equipment using advanced algorithms to control the feeding mechanisms.

What to Expect

Accuracy

The KCS Software suite can accurately recognize parts in each image and track them throughout multiple images, resulting in maximum accuracy.



99.98% accuracy with 0.02% probability of over packing

Digital Reports

The system holds digital, time-stamped data for the number of parts counted and batches created. This data can integrate with existing ERPs and can also be used as a knowledge base.

Filters				KCS Analytics Report					
	S Li	ib Id iter a value			Part Id Enter a value		Target Count Enter a value		
	Part M	Total P	arts	pert.8	pat,C pa	A.FPARLA	epert.8 epert.0	part part A	
	part of	210	- 11						
2	parts.	1,00							
	part. A	477					2.51		
5	perc.0	410							
6.	part.E	642						0.00	
2.	pert.H	290	1	-					
8.	pert_0	491					17.85		
etailed R	eport								
	Job Id F	tart Id Bato	h Number Targ	et Count Act	xul Count B	atch Start Time +	Batch End Time	Dipping Point	
	410 1	pert.D	3	80	80 Ce	10.2022, 2:48:00 PM	Oet 18, 2022, 3:48:00PM	3	
	410 1	pert.B		80	80 04	+ 9, 2022, 9 01 07 PM			
	410	eU8	2				Oct 9, 2022, 5:01:45 PM	3	
				80	80 04	19,2022,50137PM	Det 9, 2022, 5:01:45 PM Det 9, 2022, 5:01:37 PM	3	
	14 1	at,0	3	80 20	80 04 20 04	19,2022,501379M 19,2022,500079M	0x1 9, 2022, 5:01-48 PM 0x1 9, 2022, 5:01-37 PM 0x1 9, 2022, 5:00-29 PM	3	
	54 I 54 I	art,0 art,0	3	80 20 20	80 DA 20 DA 20 DA	н 9, 2022, 5 01 37 РМ х 9, 2022, 5 00 07 РМ х 9, 2022, 5 00 07 РМ	0ct 9, 2022, 5:01:48 PM 0ct 9, 2022, 5:01:37 PM 0ct 9, 2022, 5:00:22 PM 0ct 9, 2022, 5:00:07 PM	3	
	14 1 14 1	oan,0 oan,0 oan,0 oan,0	3	80 20 20 20 20 20	80 04 20 04 20 04 20 04 20 04	19, 2022, S0137PM 19, 2022, S0007PM 19, 2022, S0007PM 19, 2022, S0007PM 19, 2022, 45938PM	Det 9, 2022, 5.01.48 PM Det 9, 2022, 5.01.37 PM Det 9, 2022, 5.00.29 PM Det 9, 2022, 5.00.29 PM Det 9, 2022, 5.00.07 PM Det 9, 2022, 4.09 38 PM Det 9, 2022, 4.09 38 PM	3 3 3 3 3 3	
	14 1 14 1 14 1 14 1	oart,0 oart,0 oart,0 oart,0 oart,0	3 4 2 1	80 90 80 90 90	80 00 20 00 20 00 50 00 20 00 45 00	x 9, 2022, S 01 37 PM x 9, 2022, S 00 07 PM x 9, 2022, S 00 07 PM x 9, 2022, 4 59 06 PM x 9, 2022, 4 59 06 PM x 9, 2022, 4 59 06 PM	0x1 9, 2022, 5x8 x8 x8 PM 0x1 9, 2022, 5x8 x8 27 PM 0x1 9, 2022, 5x8 x8 27 PM 0x1 9, 2022, 5x8 x8 27 PM 0x1 9, 2022, 4x8 x8 PM	3 3 3 3 3 3 3 3 3	
	14 1 14 1 14 1 14 1 00 1	art,0 art,0 art,0 art,0 art,0 art,0 art,0	3 4 2 1 3	80 50 50 50 50 50 50 50 45 45	10 00 20 00 20 00 20 00 20 00 45 00	11, 2022, 101379M 11, 2022, 100677M 11, 2022, 100677M 11, 2022, 100677M 11, 2022, 159087M 11, 2022, 159087M 11, 2022, 159157M	Cet 9, 2022, 5:01:45 PM Cet 9, 2022, 5:01:37 PM Cet 9, 2022, 5:00:29 PM Cet 9, 2022, 5:00:07 PM Cet 9, 2022, 4:00:38 PM Cet 9, 2022, 4:01:48 PM Cet 9, 2022, 4:01:48 PM Cet 9, 2022, 4:01:49 PM Cet 9, 2022, 4:01:49 PM	3 3 3 3 3 3 3 3 3 3 3 3	
	54 54 55 55 55 55 55 55 55 55 55 55 55 5	art,0 art,0 art,0 art,0 art,0 art,0 art,0 art,0	3 4 2 1 3 2 1	80 50 50 50 50 50 50 45 45 45	80 00 30 00 30 00 30 00 45 00 45 00	14, 2022, 50137PM 15, 2022, 50807PM 15, 2022, 50807PM 15, 2022, 45958PM 15, 2022, 45958PM 16, 2022, 45915PM 16, 2022, 45915PM 16, 2022, 45915PM 16, 2022, 45915PM	Cer 9, 2022, 5 40:45 PM Cer 9, 2022, 5 60:37 PM Cer 9, 2022, 5 60:37 PM Cer 9, 2022, 5 60:07 PM Cer 9, 2022, 5 60:07 PM Cer 9, 2022, 4 59:38 PM Cer 9, 2022, 4 59:38 PM Cer 9, 2022, 4 59:38 PM Cer 9, 2022, 4 59:29 PM Cer 9, 2022, 4 59:29 PM	3 3 3 3 3 3 3 3 3 3 3 3 3 3	
	14 1 14 1 14 1 14 1 10 1 19 1 19 1 19 1	entă entă entă entă entă entă entă	2 4 2 1 2 2 1 1 1	80 20 20 20 20 20 45 45 45 45 45	80 00 30 00 30 00 30 00 45 00 45 00 45 00	14, 2022, 501 317 PM 15, 2022, 500 07 PM 15, 2022, 500 07 PM 15, 2022, 500 07 PM 15, 2022, 450 08 PM 16, 2022, 450 08 PM 16, 2022, 450 18 PM 15, 2022, 450 18 PM 15, 2022, 450 18 PM	Cert 2022, 541:49 PM Cert 2022, 541:32 PM Cert 2022, 541:32 PM Cert 2022, 540:32 PM Cert 2022, 540:32 PM Cert 2022, 459:38 PM Cert 2022, 459:38 PM Cert 2022, 459:39 PM Cert 2022, 459:39 PM	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	
	14 1 14 1 14 1 14 1 14 1 14 1 14 1 14 1 15 1 16 1 17 1 18 1 19 1 197 1 197 1	and and and and and and and and and and	a 4 2 1 3 2 1 1 1 1 5	80 20 20 30 45 45 45 45 45 40	BD DD 20 00 30 00 30 00 30 00 30 00 45 00 46 00 40 00	14, 2022, S013/FPM 24, 2022, S000/FPM 25, 2022, S000/FPM 45, 2022, S000/FPM 45, 2022, 4500/FPM 45, 2022, 4500/FPM 45, 2022, 4501/FPM 45, 2022, 4502/FPM 45, 2022, 4502/FPM	Cest 3222, 540-84 PM Cest 9,2222, 540-32 PM Cest 9,2222, 540-32 PM Cest 9,2222, 540-32 PM Cest 9,2222, 449-84 PM Cest 9,2222, 449-84 PM Cest 9,2222, 449-64 PM Cest 9,2222, 449-64 PM Cest 9,2222, 449-64 PM Cest 9,2222, 449-64 PM	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	
	14 1 14 1 14 1 14 1 90 1	ant,0 ant,0 ant,0 ant,0 ant,0 ant,0 ant,0 ant,0 ant,0 ant,0 ant,0	2 4 2 1 3 2 1 1 1 4 10	80 20 20 80 90 45 45 45 45 40 40	III III 30 00 30 00 30 00 30 00 45 00 46 00 40 00 40 00	14, 2022, S013/FPM 24, 2022, S000/FPM 24, 2022, S000/FPM 24, 2022, 45000/FPM 24, 2022, 45000/FPM 24, 2022, 45000/FPM 24, 2022, 45000/FPM 24, 2022, 45000/FPM 24, 2022, 45000/FPM 24, 2022, 45031FPM	Cest 3022, 540,447M Cest 3022, 540,247M Cest 3,2022, 540,229 PM Cest 3,2022, 540,229 PM Cest 3,2022, 449,349 PM Cest 3,2022, 449,349 PM Cest 3,2022, 449,159 PM Cest 3,2022, 449,159 PM Cest 3,2022, 449,159 PM Cest 3,2022, 449,159 PM Cest 3,2022, 444,119 PM	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	
	34 1 34 1 34 1 34 1 90 1	antă antă antă antă antă antă antă antă	2 4 2 1 3 2 1 1 1 5 10 8	80 20 20 80 90 45 45 45 45 40 40 40	III III 30 00 30 00 30 00 45 00 45 00 40 00	14, 2022, 50131744 25, 2022, 50007744 14, 2022, 50007744 14, 2022, 50007744 14, 2022, 45908744 14, 2022, 45918744 14, 2022, 45918744 14, 2022, 45918744 14, 2022, 45918744 14, 2022, 45918744 14, 2022, 45918744 14, 2022, 45418744 14, 2024, 45418744 14, 2024, 45418744 14, 2024, 45418744 14, 2024, 454187444 14, 2024, 454187444 14, 2024, 45418744 14,	Cest 3222, 545449 MM Cest 9, 2222, 545549 MM Cest 9, 2222, 555529 MM Cest 9, 2222, 555529 MM Cest 9, 2222, 455529 MM Cest 9, 2222, 455529 MM Cest 9, 2222, 455529 MM Cest 9, 2222, 445649 MM Cest 9, 2222, 445649 MM Cest 9, 2222, 445649 MM Cest 9, 2222, 445649 MM	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	
	34 1 34 1 34 1 34 1 34 1 34 1 34 1 34 1 34 1 34 1 34 1 34 1 34 1 34 1 34 1 35 1 37 1 37 1 37 1 37 1 37 1 37 1 37 1 37 1 37 1	aart.B aart.B aart.B aart.B aart.B aart.B aart.C aart.C aart.C aart.C aart.C	3 4 2 1 3 2 1 1 1 5 1 1 9 5 10 8 7	80 20 20 20 20 20 20 45 45 45 45 40 40 40 40	IIII IIII 30 00 30 00 30 00 45 00 45 00 46 00 40 00 41 00	14, 2022, 501,517 PM 54, 2022, 500,07 PM 14, 2022, 500,07 PM 14, 2022, 500,07 PM 14, 2022, 450,08 PM 15, 2022, 450,08 PM 15, 2022, 450,08 PM	Cest 3022, 540:44794 Cest 3022, 540:547974 Cest 9, 2023, 540:25794 Cest 9, 2023, 540:25794 Cest 9, 2022, 540:8794 Cest 9, 2022, 459:87949 Cest 9, 2022, 459:47949 Cest 9, 2022, 454:47949	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	
	14 14 14 14 14 14 14 14 14 14 14 14 14 1	2011.0 2013 2013 2013 2014 2014 2014 2014 2014 2014 2014 2014	3 4 2 1 3 2 1 1 1 3 5 6 7 6	80 20 20 20 20 20 20 45 45 45 45 45 40 40 40 40 40	IIII IIII 30 00 30 00 30 00 30 00 40 00 40 00 40 00 40 00 40 00 40 00 41 00	14, 2022, 6313/944 14, 2022, 6010/794 14, 2022, 6000/794 14, 2022, 6000/794 14, 2022, 4000/794 14, 20	Cest 3222, 46144 FM Cest 3222, 46144 FM Cest 9, 2225, 46124 FM Cest 9, 2222, 45124 FM Cest 9, 2222, 45144 FM Cest 9, 2222, 45144 FM Cest 9, 2222, 45144 FM Cest 9, 2222, 45144 FM Cest 9, 2222, 4414 FM Cest 9, 2222, 4444 FM	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	
	14 1 14 1 14 1 14 1 19 1 19 1 19 1 19 1	and and and and and and and and and and	3 4 2 1 3 2 1 1 1 5 10 8 7 6 5	80 20 20 20 20 20 20 20 20 20 2	IIII IIII 30 00 30 00 30 00 30 00 45 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00	14,202,2013/944 14,202,2007/944 14,202,2007,500/9744 14,2022,499/0494 14,2022,499/0494 14,2022,499/0494 14,2022,499/0494 14,2022,499/0494 14,2022,445/944 14,2022,445/944 14,2022,445/944 14,2022,445/944	0115 2022, 613, 614, 614 0115 2022, 613, 613, 614 0115 2022, 613, 6102, 714 0115 2022, 6102, 714 0115 2022, 6103, 714 0115 2022, 6403, 714 0115 2022, 715 0115 2025, 715 0115 20	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	

Quick Configuration

KCS quickly adapts itself to a large variety of parts. Just show the KCS some examples of your object and the system will quickly learn to count it.



Example Training Flow

Each configured part is available on the Operator Screen as a "Recipe" to select from.



🕲 +91 98934 52000

Advanced Speed Control

KCS can control speeds of equipment such as conveyor belts and linear vibratory feeders and adjust the speedfor creating batches. The Sweet spot between high-speed and high-accuracy is delivered.



Intuitive Operator Interface

KCS provides an interface that is both operator friendly and touch enabled.



Pre-Automation and Post-Automation



Pre Counting Automation:

Prevents objects from interlocking and overlapping.

- Bowl Feeders
- Linear Feeders

Post Counting Automation:

Creates batches and packets and helps automate the packing process.

- ► FFS Machine
- Conveyor Belt
- Printers

Additional System Features and Benefits



Accurately count many items at once, speeding up the counting process. Also known as bulk counting.



Suitable for use with a wide range of complex and irregular parts, such as hardware, brass, fasteners, metal injection molding, plastics, and the like.



Integration with industrial control equipment, such as feeder controllers, motor drivers, and packing machines.

Technical Specifications



KCS Model Number	R-KCS-G98-100 Free-Falling Counting	R-KCS-G98-200 Free-Falling Counting	R-KCS-G98-300 Free-Falling Counting			
Part Size	~ (5mm to 30 mm)	~ (5mm to 60 mm)	~ (25mm to 90 mm)			
	All three dimen	nsion ratio should be in betwe	en 0.7 to 1.3			
Aspect Ratio (W/L) & (H/W) & (L/H)	Height Width Length					
View Area (width x height)	200 mm x 100 mm	200 mm x 200 mm	800 mm x 300 mm			
Speed	Speed of the system depends upon the feeding mechanism and is subject to fluctuation based on the shape and dimensions of the components					
speed	Count ~ 1000 parts/min of 10 mm size					
Controller	Kiara AI engine (IPC) Intel® Core™ i5 - 3300 CPU @ 3.00 GHz x4 NVIDIA Corporation TU116 [GeForce GTX 1600 SU OS- Ubuntu 20.04.1 LTS 64 bit		GHz x4 1600 SUPER] it			
Batching	Operator Assisted batching is possible. Can combine a single-part feeder to be turned on after 95% batch completed.					
UPS		1600VA				
Camera & Lens	Camera - 1.3 Megapixel, 8mm lens					
Interface Options	RS232/RS485/USB/WiFi					
Electrical Panel		PLC, SMPS, Feeder Controlle	r			
PLC Model	Delta - DVP14SS2 MPU points: 14 (8DI + 6DO) COM Ports: RS485, RS232					
Pre Automation/ Feeding Module	2 channel (0 to 10V) Analog signal is available for vibratory feeder integratio Recommended Feeders:					
	Single 24V Digital output and input is available for packing machine, Conveyor stopping, or any other post automation integration					
Post Automation	a. 95% of Target Count Reached. b. 100% of Target Count Reached c. Delay options for above 2					
Environmental Conditions	45°C 90% I	RH 336 hrs, Oil and dust free e	environment			
Power Requirements	230V AC, 5A					
Part Constraints	Unbreakable and Non S non-overl	Scratching, no foreign particle apping, non-interlocking, non	s, Solid parts, non-sticky, -elongated			

Customized Models



KCS-CT

Camera & Controller	1.3MP Global Shutter. Kiara Lite Controller. NVIDIA Maxwell based.	
Synchronization	Encoder with Wheel	
Feeding Control	2 channel (0 to 10V) Analog signal is available for vibratory feeder or conveyor speed integration	
View Area	300x300 mm (can be customized)	
Loading	Loading & Separation be ensured by feeding system or done manually	
	24V Signal available at	
Unloading	 95% of Target Count Reached. 100% of Target Count Reached 	
omouting	Can integrate conveyor stopping, packing machine, or any other post automation. Time Delay Options available.	
View Areas & Part sizes	Example: View Area: 200 x 200 mm Min and Max PartSize: 1.5 mm, 50 mm	
Trigger & Action	Button on Screen or push-button. Accept count or re-count.	
Batching	Operator Assisted batching is possible. Can combine a single-part feeder to be turned on after 95% batch completed.	
Overpacking	Overpacking refers to extra parts being packed which the system identifies. Corrective action can be taken to reject.	
Part Teaching	Required for every new family of parts	



KCS-TT

Camera & Controller	1.3MP Global Shutter. Kiara Lite Controller. NVIDIA Maxwell based.
View Areas & Part sizes (Can be customized)	Example: View Area: 200 x 200 mm MinPartSize: 1.5 mm MaxPartSize: 50 mm
Loading, Unloading & Separation	Manual
Trigger	Button on Screen or push-button
Action	Accept count or Recount
Time	Single Trigger Cycle: < 50 msec
Batching	Can combine multiple triggers until specified count is reached.
Part Teaching	Required for every new family of parts



Dimensions





Note: Tray isn't part of the module. It is for representation purpose for the feeding module.

Important Note for System Integrators & End Users

The Kiara Counting System (KCS) is not a magic wand.

It operates within given constraints for counting many types of parts. Complex Al models and tracking logics ensure accuracy, but material movement depends heavily on part shape and material. Expectations should be managed and joint knowledge sharing is necessary. Robro Systems has a dedicated R&D team and a roadmap for new features and covering more variety of parts. We welcome discussions and suggestions on system improvements.

Thank you for your kind understanding and cooperation.