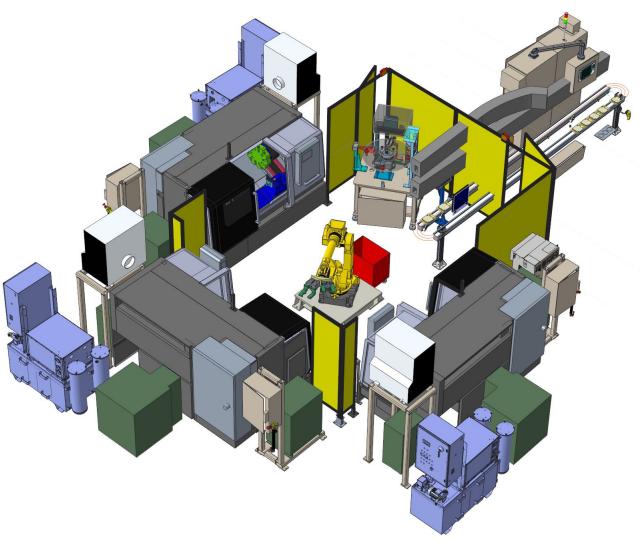


+Vantage Case Study: Material Handling Systems & CNC Automation

Tripod Housing Gage Tool Compensation and CNC Automation Lathe Cell







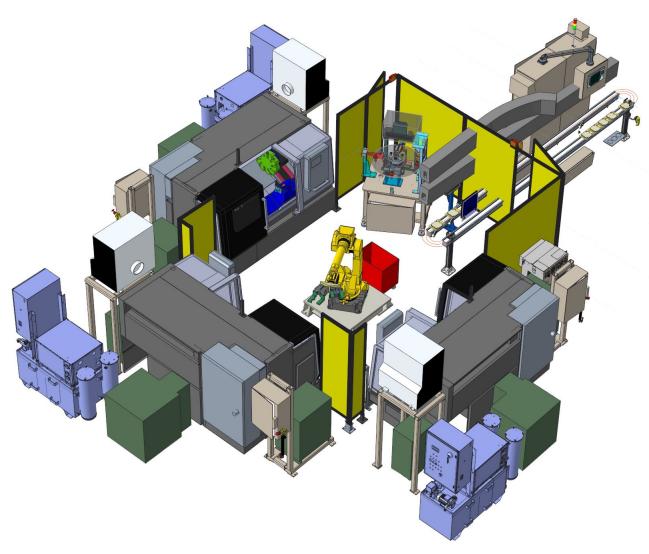
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- Parts:
 - Tripod Housing
- Customer Problem:
 - The machining & inspection process was too labor intensive for material handling
 - Extensive process required inline gage feedback for tool compensation
 - The parts need required serialization & part marking for traceability
- The project:
 - Parts enter the cell via a powered conveyor. Inside cell all material handling is managed with Robot. Robot tends Machining process on (3) CNCs. Part is inspected at automatic inline gage station. Data reports back to Cell computer where Tool Compensation values are calculated and reported back to CNCs as required. Parts Leave VIA Powered Conveyors.
- Process:

2

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- Incoming Power Conveyor
- Robotic Part Handling
- CNC Machining Tending
- Automatic Gaging with Tool Compensation
- Outgoing Power Conveyor



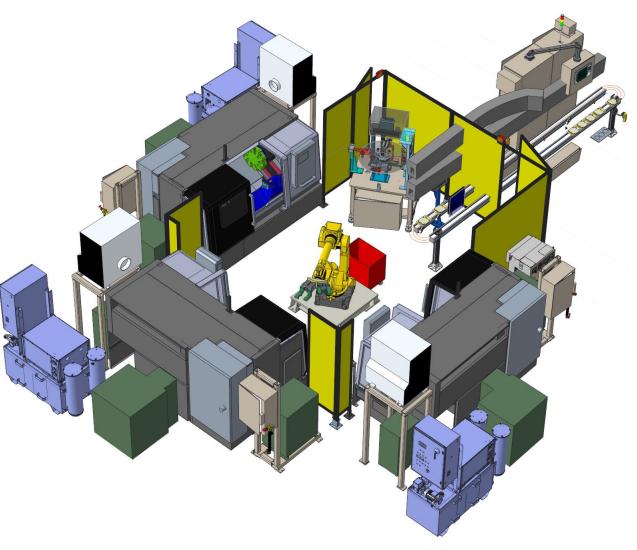
- Components:
 - Incoming Powered Conveyor
 - Fanuc Robotics
 - Custom EOATs with Festo Pneumatic Grippers
 - Solartron LVDT Probes
 - Keyence Barcode Reader
 - Keyence 2D Optical Micrometer
 - Telesis Impact Pin Marker
 - DMG Mori CNC

3

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- Safety interlocks
- Allen Bradley Controls





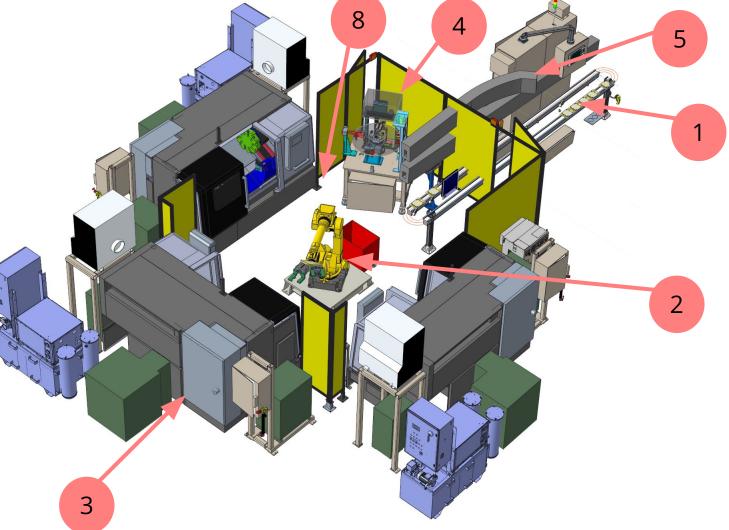
- Overview:
 - 1. Incoming Station
 - Powered Belt Conveyor
 - 2. Cell Tending Robot
 - Custom Dual Gripper EOAT
 - 3. CNC Machines
 - Inline Machining
 - Tool Compensation
 - 4. Inspection Station
 - Inspections Include
 - ID Size
 - OD Size
 - Marking Impact Marking
 - 5. Outgoing Station

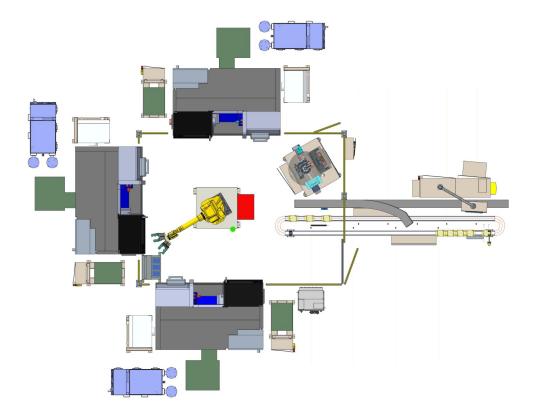
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- Outgoing Powered Belt Conveyor
- Outgoing Reject Conveyor



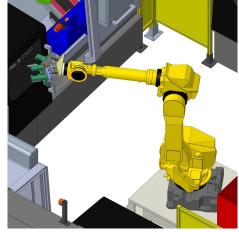




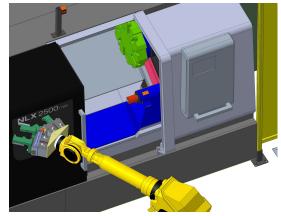
Layout





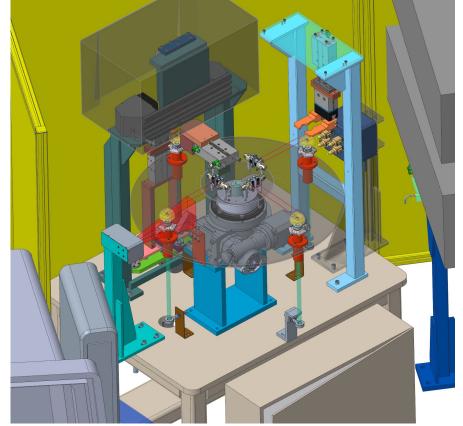


Robotic CNC Tending

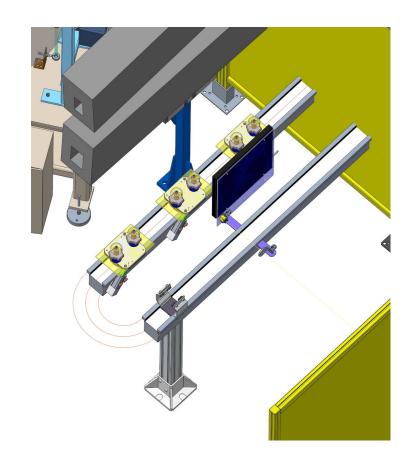


CNC Machining





Inline Gaging with Tool Compensation



Powered Conveyors





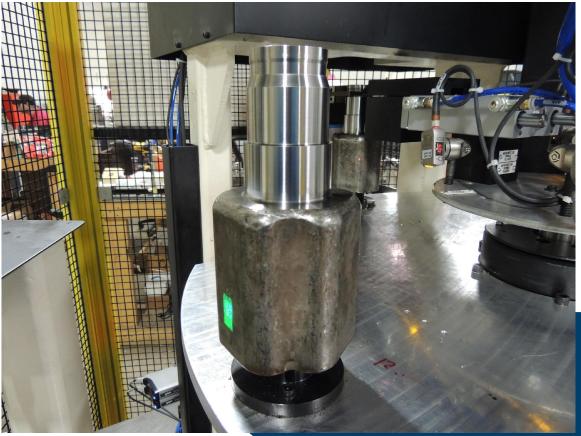




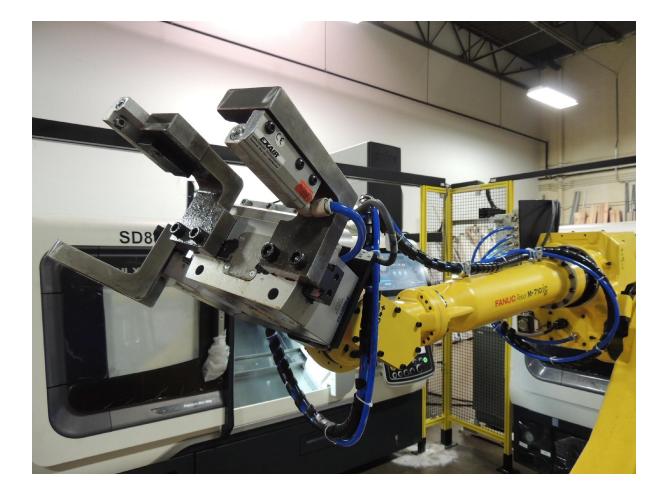


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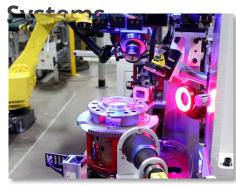




Core Product Overview



Inspection



Vision, Laser, Pneumatic, Dynamic, Torque, as well as Classification and Identification

Engineering & Service



Let the +Vantage team's decades of experience solve your manufacturing challenges

Automation &



Fully automatic systems to streamline your manufacturing process and increase production

Assembly Systems



Manual and semi-automatic multi-station assembly systems for pressing, torqueing, & riveting

Automation Made Seamless

Systems



Custom design or upgrade/retrofit existing lines with the latest sensors and manufacturing technology

Industrial



Contact and non-contact gages for precision measurements. In-line and audit room.

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Global Customer Reach



tel: +52 1 844 270 9389

Pudong New Distric Shanghai. 200120 tel: +86 137 7103 2628



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Automation Made Seamless

tel: +1 734 432 5055

Company Overview



Company Size

- •70 Employees Globally
- 100,000 sq. ft in Livonia
 - Additional office space globally

Certifications

- ISO 9001:2019
- Coherix System Integrator
- Fanuc Authorized Integrator
- Q-DAS ASCII Certification
- Schunk Official Partner
- Solartron Orbit 3 Integrator



+VANTAGE

% 21 Mar'21 Apr'21 May'21 Jun'21 Jun'21 Jun'21 Jun'21 Aug'21 Complete 7 14 21 28 4 11 18 25 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8

Camcor 200752 Timing Plan.mpp

100%

Start

116 days Fri 2/19/21 Fri 7/30/21

3 days Fri 2/19/21 Tue 2/23/21

Finish

Duration

Project Management

										eceive PO			Fri 2/19/21	100%	1					
										itial kick off meeting			Tue 2/23/21 4	100%	3					
										ssign a Job Number to the Project in QuickBooks			Tue 2/23/21 4	100%						
									7 Se	end PO Acknowledgment	2 days	Mon 2/22/21	Tue 2/23/21 4	100%						
									8											
										nanical Engineering			Mon 4/19/21	62% 100%	4					
										roject in Engineering Cue reate Approval Drawings and submit to Customer			Fri 2/26/21 5 Mon 3/29/21 10	100%			-			
									11 Ur 12 Dr	reate Approval Drawings and submit to Customer			Wed 4/7/21 11	0%			Eng			
									fol	esign approved by Customer - Design updates by Danilo llowing feedback and discussions with Camcor ** Critical Path	7 days	Tue 5/50/21	Wed 4///2111	0.26		2	Eng_App			
									13 Co	omplete mechanical design	5 days	Thu 4/8/21	Wed 4/14/21 12	0%						
									14 Re	elease commercial items and build details	3 days	Thu 4/15/21	Mon 4/19/21 13	0%						
									15											
									16 Elect	trical/Pneumatic Engineering			Fri 6/11/21	0%			-			
						-				ical design and submit for Approval			Wed 5/5/21 13	0%				Elec		
+Vantage - Action Item Deck			Action Item Deck	Project: Camcor 200752 Assembly System					SPIRITURE CONTRACTOR OF STREET	ved Customer approval for Electrical/Pneumatic design	0 days Mon 5/10		Mon 5/10/21 17	0% 0%						
			Contractin Book							utility information with Camcor								5/10		
F	evised 3/24	4/21							Q064 Action Item Deck Rev 1 9-18-201	Je electrical balla			Fri 5/14/21 19	0%						
-						-				amming	20 days	Mon 5/17/21	Fri 6/11/21 20	0%				Prog		1
	item	Operation	Item Description	Key Contact fo	Actions	Date Open	Target Close date	Actual Close Date	Comments (and note effectiveness if applicable)		70.1	T 10005	7. 7/00/04	001						
+	2003			Rem			uate	Date		sembly			Thu 7/29/21	0%						
							1	1		facturing ve Electrical/Pneumatic items		Tue 4/20/21 Mon 5/31/21		0%				Mntg		
									(3/10 Shawn working to get this info from Eston) (3/18 Shawn still waiting for info - will try again) (3/24 Shawn sent some older	ve Electrical/Preumatic items ve parts from Customer for Setup and Runoff		Tue 6/1/21		0%				→ • 6/1		
									still waiting for info - will try again) (3/24 Shawn sent some older 2018 and 2019 data - loads are VERY low some around 126 N	r ve parts from Customer for Setup and Runoir		Tue 6/1/21 Tue 6/1/21		0%				► 6/1		
									Danilo talked with Promess and they calculated 12.5 Kn. Big	why why a state of the state of	19 days	Tue 6/8/21		0%					-Ass'v	
6		Press	max expected press force for retainer	Shawn		3/8/2021	3/12/2021		difference Shawn still trying to get current data. Danilo said	ate programming and debug		Mon 7/5/21		0%						ebua
		1635	max expected press force for retainer	Shawn		3/0/2021	3/12/2021		Shawn could send sample parts to Vantage and the Vantage could send parts to Promess. Per Shawn they are not machining		15 days	10011113/21	1110 1123/21 20	0.16						ebug
									parts now - would need to get parts from Eston. Shawn to see if	at Vantage	1 day	Fri 7/30/21	Fri 7/30/21	0%						
									he can get 5 shafts from Eston and some retainers we can send	d m	1 day	Fri 7/30/21		0%					Tr Contraction	Runoff
									to Promess)	mer Acceptance	1 day	Fri 7/30/21		0%					2	
											,									
										Package/Ship	2 days	Mon 8/2/21	Tue 8/3/21	0%						
- 1									(3/18 +/1 current tolerance. Vantage is wondering if in process	s n	1 day	Mon 8/2/21	Mon 8/2/21 33	0%					1	
- 1									spec could be that all diameters on one part are held within tighter tolerance) (Per Bobby Large journal will be +/- 0.01 mm		1 day	Mon 8/2/21	Mon 8/2/21 33	0%					1	
		Eng	Shawn to look at in process tolerances for journals - Danilo is	Shawn		3/10/2021	3/12/2021	3/24/2021	and smaller inside journals can be +/- 0.1 mm. They are done in different operations. Bobby indicating concern with shaft	/21)	1 day	Tue 8/3/21	Tue 8/3/21 37	0%						Ship
9		cng ,	considering to use Vees to support journals during press.	Snawn		5/10/2021	5/12/2021	5/24/2021	different operations. Bobby indicating concern with shaft											
									bending. Critical item to get press force info - see item 5 so analysis of potential bending can be performed) (3/24 will close		1 1									
									see item 5 and 15)											
- L											-						A REAL OF			
		Feeding	Vantage using Feeding Concepts for feeding systems. Request	Ū					(3/18 Shawn will investigate. Vantage has developed this project with Feeding Concepts before specification was received.) (3/24				State of the second							
1	1	system	deviation from Camcor spec that was sent 3/12. PO has been	Shawn		3/18/2021	3/19/2021	3/24/2021	Deviation approved to use Feeding Concepts - commercial issu	10	Car an									
- 1			piacau.						- Vantage did not have machine spec revision in quoting stage)		12.1									
- 6				-		-		-												
	- I		Bobby requesting to look at feasibility to check retainer height 0/-	- Denile Tedd		3/18/2021	3/31/2021		(3/24 request in in Proposal department - should have by next		1000									
	•		0.3	Calmorroud		5 10/2021	3.3112021	1	week)		and the second se	COMPANY OF STREET, STR	and the second se							
H						-						And in case of the local division of the loc	the second s							
		Feeding									C				and the owner where the owner w					
1	3	system	1/2 cubic feet retainers and coffee can of balls	Shawn		3/18/2021	4/1/2021		(3/24 Shawn working with Eston to try and get parts)									Construction of the local division of the lo	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
L										and the second s									AND CURE	
		Chinging							(Concerned and 2020) from Observe UNIA info	and a second second second						-				
1	4	Shipping/ install info	Shawn requesting info re. shipping and utilities	Shellie/Zach	ETA Leaving BTA Leaving at Crating? Special Verkage Stoctricel Service Size	3/22/2021	7/23/2021		(See email sent 3/22/21 from Shawn. Utility information can be provided sooner after electrical design)	THE REAL PROPERTY IN THE REAL PROPERTY INTO THE REAL PR					_				A CONTRACTOR OF	
	[States and Street St.				
- 1																-	and the second division of the second divisio			-
									(3/24 Danilo did Preliminary FEA study on current design based	d							and the owner of the			-
1	5	Eng	FEA Study for press operation	Danilo	Ref Item 5 and item 9				on 20Kn and 12.5Kn. If 20Kn force applied, will deform shaft. 12/5Kn would not deform shaft. Is below max yield)										Contraction of the local division of the loc	
								1												
						1							And I I I I I I I I I I I I I I I I I I I							

ID Task Name

Open Job

Camcor 200752 - Base Shaft Assembly System

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Marking Systems DATALOGIC THE VISION IS YOURS

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TELESIS

VIDEOJET.

Allen-Bradley

SIEMENS

PLC





Ingersoll Rand

Torquing/Press

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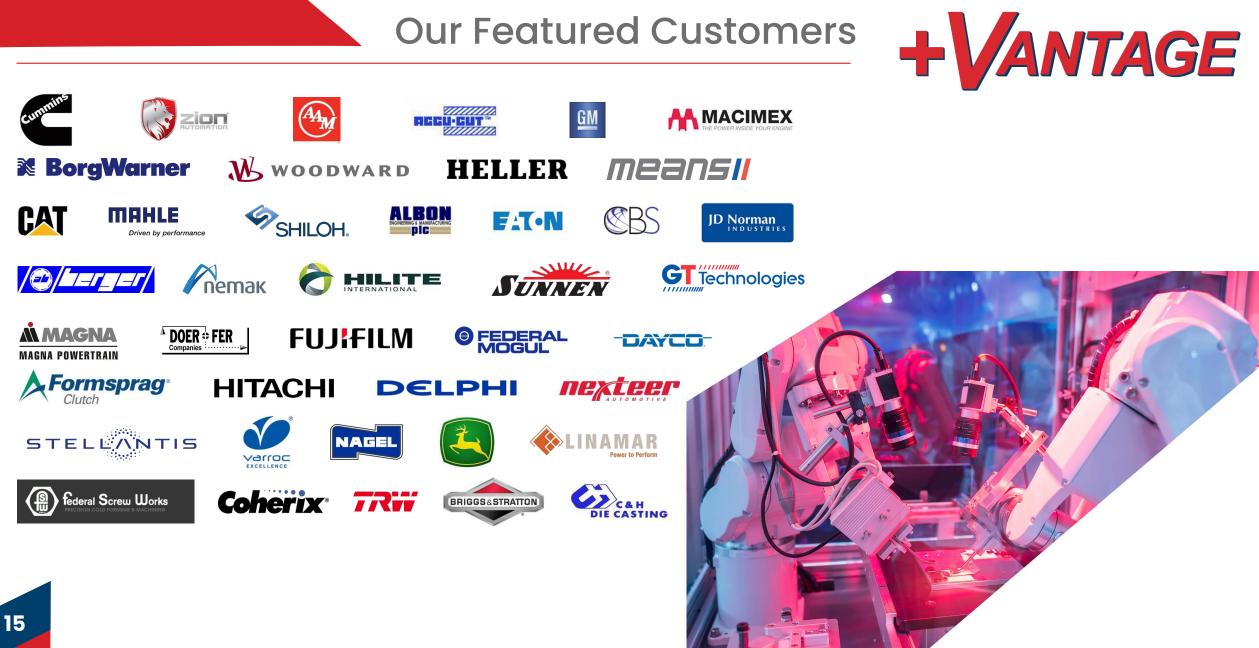
Atlas Copco





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14



On-Site Service & Support

100% Dedication to Customer Service

Global Support On-Site Representatives

Quick Response Unit and Down Time Recovery

Remote Log In Service in a Moments Notice

24/7 Service Support

16

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On-site Contracts Available

Highly Trained Staff of Engineers & Technicians











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Automated Inspection

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Canada London, ON Canada tel: +1 226 234 1515

Thank You for Reading! Zero Defects

China

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