

Technology Solutions to Improve QC and Efficiency in Production Area Processes



Key Reasons to Automate Processes

1. Eliminate / control manual tasks that cause errors due to confusion, distraction, boredom
2. Simplify procedures to reduce labor, inefficiency
3. Enforce standard operating procedures (SOPs) via software controls to ensure consistent performance and accountability
4. Get real-time 20/20 visibility into operations:
 - WIP tracking
 - Production
 - Packing
 - Labeling
 - Shipping
5. Create Traceability records automatically
 - Backward traceability from finished item back to production, back to raw parts / components
 - Forward traceability from production to customer shipment



SPEDE Solutions Automate these Processes:

1. Parts Identification
2. Parts Counting
3. Parts Tracking
4. Parts Serialization
5. Differentiating Good Parts vs. Scrap
6. WIP Components Tracking
7. WIP Operations Traceability
8. Production Reporting
9. Packing of Containers/ Dunnage
10. Container Labeling
11. Shipping
12. Traceability – RAW, WIP, FIN
13. For Honda – Small Lot Store, Honda Batch



Weigh scales automate parts counting and labeling

SPEDE Solutions Integrate these Technologies

- Production Machine PLCs
- Weigh / Count Scales
- Vision Sensors
- USB Cameras
- OCR
- 2D Encoders, Etchers, Scanners
- Conveyors/ Diverters
- Label Printers
- Touchscreen PCs
- WiFi and Wired networks
- Interfaces to Host ERP, EDI, RAS, OEE systems

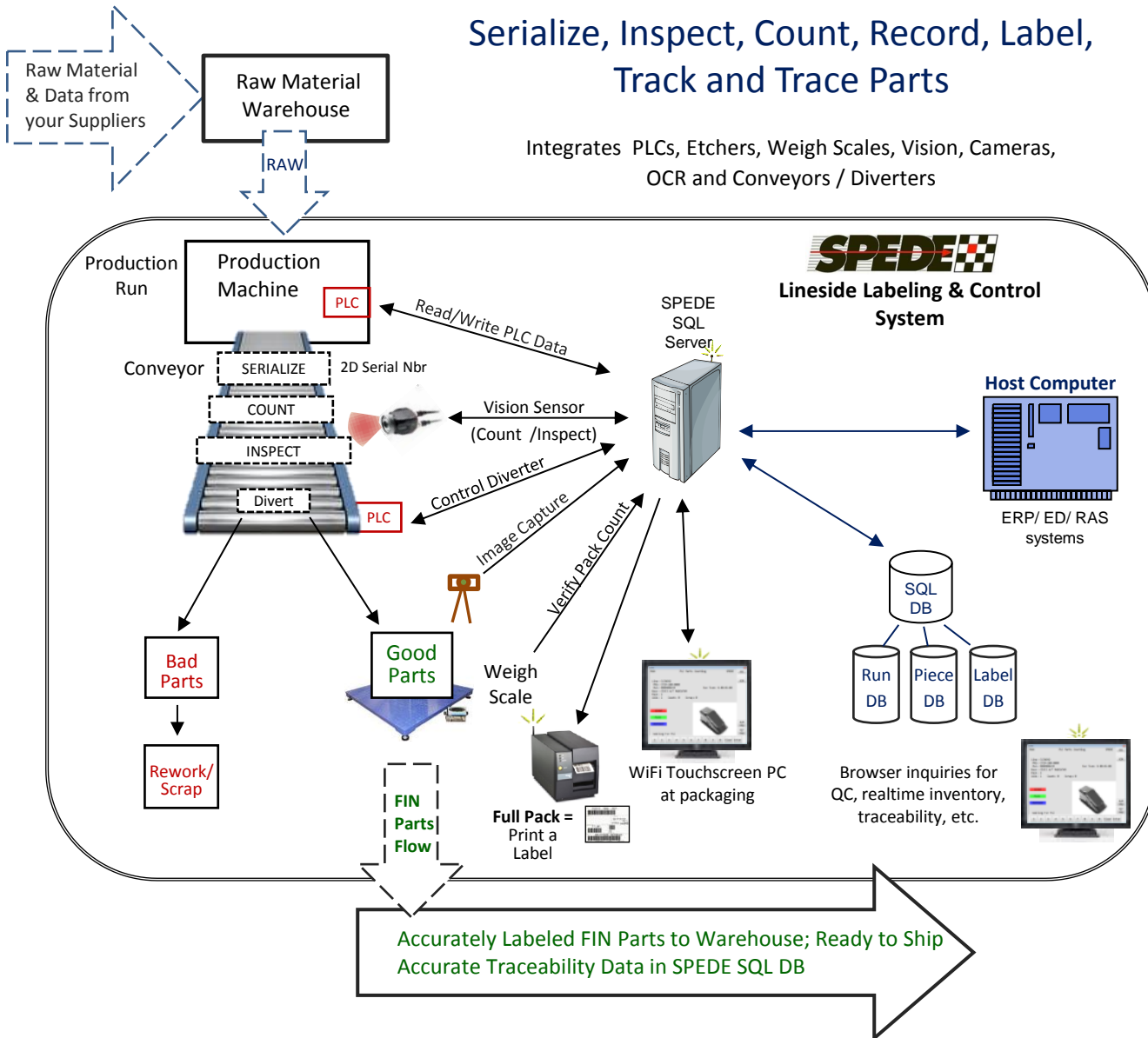


Vision sensors can validate parts for correctness, and ensure accurate pack counts

Diagram of SPEDE Functionality

Serialize, Inspect, Count, Record, Label, Track and Trace Parts

Integrates PLCs, Etchers, Weigh Scales, Vision, Cameras, OCR and Conveyors / Diverters



Accurately Labeled FIN Parts to Warehouse; Ready to Ship
Accurate Traceability Data in SPEDE SQL DB

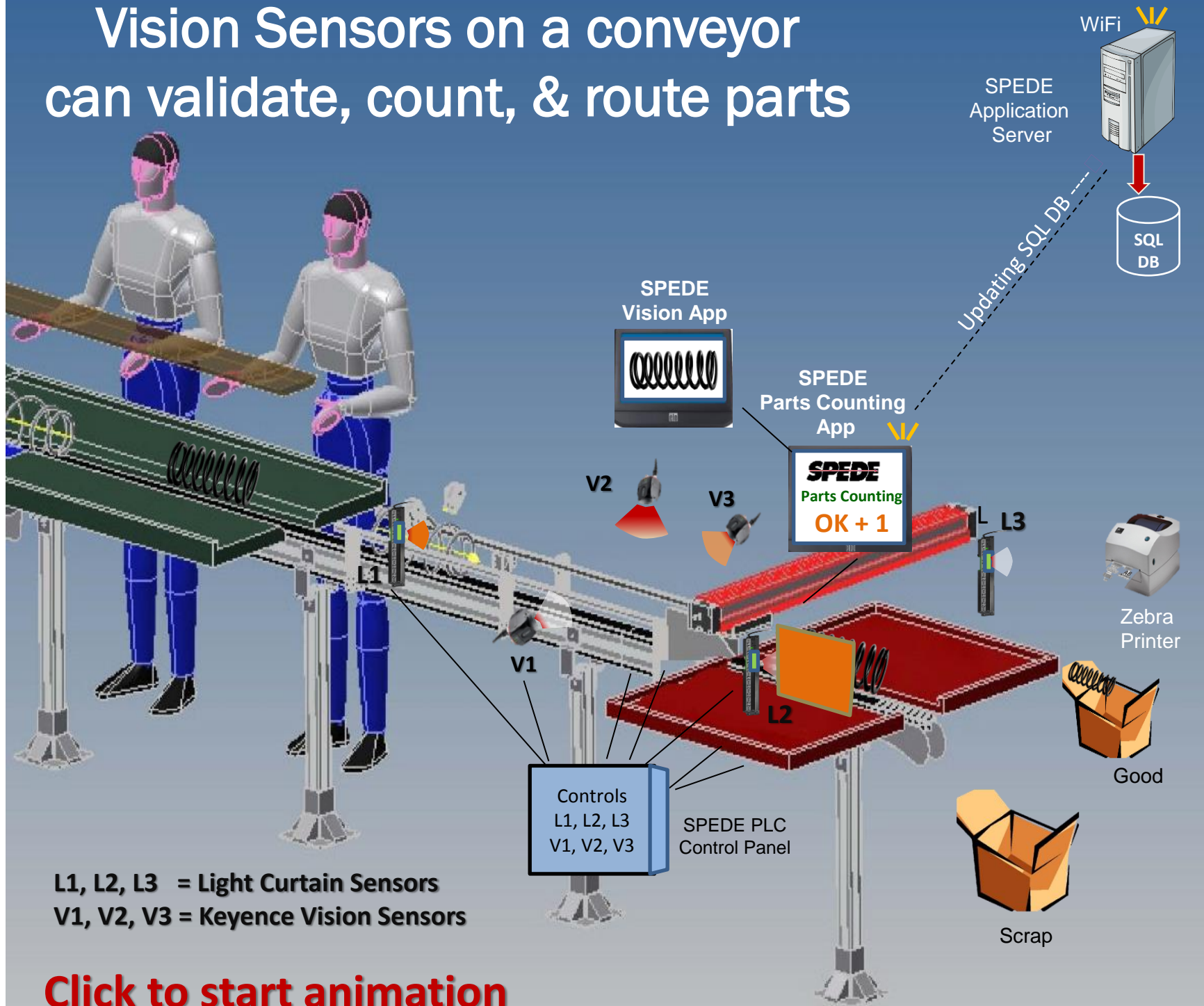
SPEDE reads the Part and ...

- Verifies Part for correctness
- Diverts wrong or bad part
- Counts good parts toward pack
- Weigh-counts the Parts Container
- Prints the Customer Container Label
- Collects OEE Data / Updates host
- Collects Track & Trace Data

Functionality can be Phased-in

- Validate Parts/ Components for correctness, defects
- Serialize Individual Parts
- Automate Piece Counts
- Display real-time Piece Counts, Label Status, Machine Data, etc. on Touchscreen PC
- Control Partials at end of run /shift
- Automate Container Labeling
- Create a History of Individual Parts including Rework
- Export Label Data to EDI / Shipping
- Export Production Data to ERP / OEE
- Trace Serialized Parts by Part Number, Lot, Container, Line, Run Date, etc.
- Trace Parts Forward to Customer; Back to Production/ Suppliers
- Confirm Processes / Accountability
- Enable Honda MPR Compliance

Vision Sensors on a conveyor can validate, count, & route parts



[Click to start animation](#)

6 Benefits of Automating Processes

1. Error Prevention:

- Identify good parts vs. scrap; divert scrap
- Validate correctness of a part at packing
- Ensure correct routing of WIP through a sequence of operations
- Prevent mis-labeling of parts /containers
- Prevent shipping errors - wrong part, under / over-ship
- Prevent kitting errors

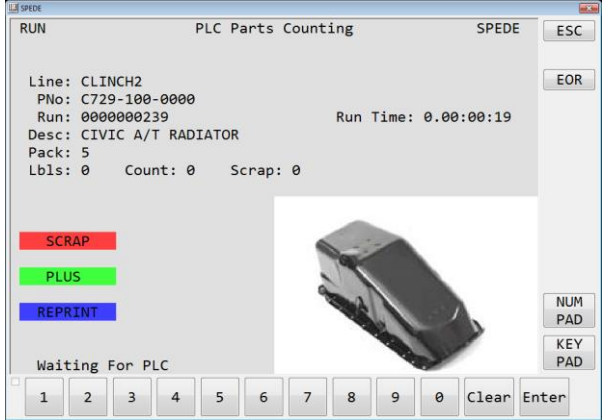


A Vision Sensor can detect missing parts in this Jack Kit

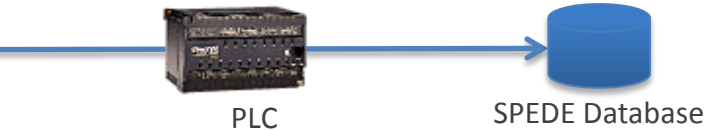
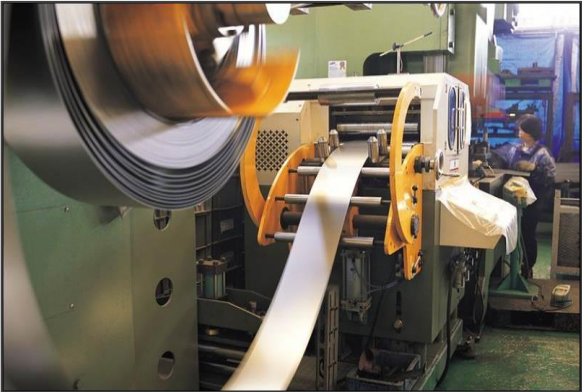
6 Benefits of Automating Processes

2. Real-time Production Data:

- For analyzing efficiency, monitoring actuals vs scheduled
- Use TouchScreen PC at line-side to view / edit
- Real-time piece counts, label status, run data
 - Automatic piece counts of good and scrap
 - Sends production data to host systems automatically



Line-side Touchscreen PC Displays Real-time Parts Counting Data



Part Nbr	Description	Run Nbr	Start	Stop	Elapsed	Scrap	Good	Containers
C729-103-0000	ACCORD M/T RADIATOR	000012001	08:03:22	12:01:10	03:57:48	11	200	40
C729-103-0000	ACCORD M/T RADIATOR	000012004	13:01:06	17:38:57	04:37:51	19	240	48
C729-103-0000	ACCORD M/T RADIATOR	000012007	18:20:07	23:30:45	05:10:38	9	260	52
					13:46:17	39	700	140
C729-101-0000	CIVIC M/T RADIATOR	000012012	07:58:26	12:10:00	04:11:34	13	180	36
C729-101-0000	CIVIC M/T RADIATOR	000012016	13:12:35	17:28:20	04:15:45	8	160	32
C729-101-0000	CIVIC M/T RADIATOR	000012017	19:00:05	23:40:10	04:40:05	11	205	41

6 Benefits of Automating Processes

3. Accurate Packing and Labeling:

Use Weigh Scales to:

- Receive Accurate Piece Counts / Weights
- Trigger a container label when count/ weight is correct

Use Vision Sensors to:

- Count and verify the manufactured part is “good”
- Verify dunnage layer is correct
- Verify all components are in a Kit

Use USB Cameras to:

- Count parts as they are placed in dunnage
- Read a 1D/2D barcode or OCR characters on the part
- Verify part via image, serial nbr, and/or OCR on part
- Direct the operator to fill slots in sequence
- Verify all dunnage slots are filled with the correct part
- Provide video proof that dunnage was filled correctly
- Verify Pack Count in dunnage is correct

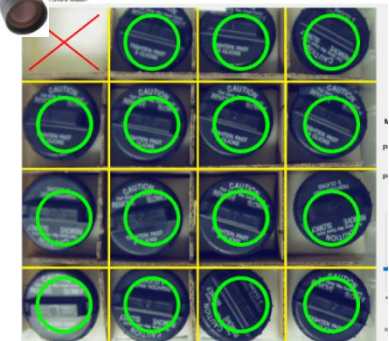
Print serialized label automatically; update Host ERP, EDI



Weigh scales trigger label-printing



USB Camera



Camera detects an empty slot in this dunnage layer. Container label won't print until slot is filled. **Green circle** indicates slot is filled with correct part.

6 Benefits of Automating Processes

4. Automatic Traceability by Component / Part / Container:

- A serial number is linked to each Part's production data:
 - Production Machine, Run Date, Shift, Operator, Lot, Location, etc.
 - Container Serial Number(s) in which the Part was packed
 - All other Serialized Parts in a generalized Container
- Provides Traceability by Part, Lot, Container, Line, Run Date, etc.
- Forward Traceability from Production out to Customer
- Backward Traceability from Production back to Receiving, Raw Components, Supplier

Printed By: Dan Worthington
Report Date: 01/08/2013
Report Time: 08:35:00
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Container Trace: 0319804-05088465

Part Nbr	Description	Run Nbr	Line Nbr	Create Date	Create By	Qty	Item S/N
C729-101-0000	CIVIC M/T RADIATOR	000012001	CLINCH2	11/05/2012	JSMITH	5	AB879762351 AB879762352 AB879762353 AB879762354 AB879762355



6 Benefits of Automating Processes

5. Process Control and Accountability:

- All SPEDE operations require Associate sign-in
- All transactions are retained and accessible in the SQL Txn DB
- Ensures SOPs are followed



Sample Manufacturing Metrics Report

	OEE %	Earned DL Hrs	Actual DL Hrs	Net Var.	Labor Prdvtly %	Mach. Util %	F.G. Scrap %	In-Proc. Scrap %
All Department Total(s)	83.4%	853	1,013	(160)	84.2%	87.8%	2.0%	1.0%
<u>Total Parts</u>	<u>Good Parts</u>	<u>Scrap Parts</u>	<u>Available Time</u>	<u>Unscheduled Down Time</u>	<u>Machine Hours Worked</u>	<u>Actual Downtime Hours</u>	<u>Earned Machine Hours</u>	
28,304	27,583	721	261	20.05	229.42	66.02	223.53	
<u>Actual Man Hours</u>	<u>Man Hour Downtime</u>		<u>(S) Finished Scrap \$</u>	<u>(SM) Misc Scrap \$</u>	<u>(I) In-Proc Scrap \$</u>	<u>Total Scrap \$</u>		
770	242		\$4,035.74	(\$59.51)	\$2,076.35	\$6,052.58		
	<u>Utilization %</u>		<u>Good Part %</u>		<u>Machine Efficiency %</u>		<u>Total Production \$</u>	
OEE Factors:	87.8%	*	97.5%	*	97.4%		\$205,285.19	

Typical Production Data stored in DB:

- Part Number
- Operator Nbr
- Shift, Date, Time
- WO Nbr
- Lot Nbr
- Machine Cycles, Cycle Timestamp
- Part Count: Good, Scrap, Re-work
- Machine Stats & Metrics, etc.

	OEE %	Earned DL Hrs	Actual DL Hrs	Net Var.	Labor Prdvtly %	Mach. Util %	F.G. Scrap %	In-Proc. Scrap %
5515 Crankshaft	95.2%	141	168	(27)	83.8%	82.3%	0.6%	0.2%
<u>Total Parts</u>	<u>Good Parts</u>	<u>Scrap Parts</u>	<u>Available Time</u>	<u>Unscheduled Down Time</u>	<u>Machine Hours Worked</u>	<u>Actual Downtime Hours</u>	<u>Earned Machine Hours</u>	
885	880	5	21	2.92	17.28	6.72	20.11	
<u>Actual Man Hours</u>	<u>Man Hour Downtime</u>		<u>Shift Count</u>	<u>(S) Finished Scrap \$</u>	<u>(SM) Misc Scrap \$</u>	<u>(I) In-Proc Scrap \$</u>	<u>Total Scrap \$</u>	
121	47		3.00	\$253.62	\$0.00	\$108.44	\$362.06	
	<u>Utilization %</u>		<u>Good Part %</u>		<u>Machine Efficiency %</u>		<u>Total Production \$</u>	
OEE Factors:	82.3%	*	99.4%	*	116.4%		\$44,890.02	

6 Benefits of Automating Processes

6. Enables and Simplifies Honda MPR Compliance:

- Pre-production
- Process Set-up
- Production / WIP
- Re-pack / Re-label
- Small Lot
- Pass thru
- Shipping
- Accountability & Traceability



Meet a Few SPEDE Customers...





To Discuss Your Line-side Project...

Call or Email ...

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About Us:

We are a software and systems integration company founded in 1980 as Computer Software Corporation, specializing in technology solutions for automotive suppliers and manufacturers. Our focus is automating production area processes to prevent errors, increase efficiency and provide real-time 20/20 visibility of shop floor operations.

The name SPEDE (pronounced speedy) is an acronym for Standard Platform for Electronic Data Entry. We assumed this d/b/a in 1994 to reflect the wide range of new and legacy technologies that we can integrate to form a single real-time communications platform on the plant floor.

Our Customers are mid-size to Fortune 500 companies with multiple plant sites throughout the U.S. , in Canada and in Mexico. They rely on SPEDE Automated Line-side Solutions to keep their mission-critical processes running smoothly, 24/7.



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Simplifying Processes... Standardizing Excellence.®