

Component & Operations Traceability with Inventory and Line-side Functions



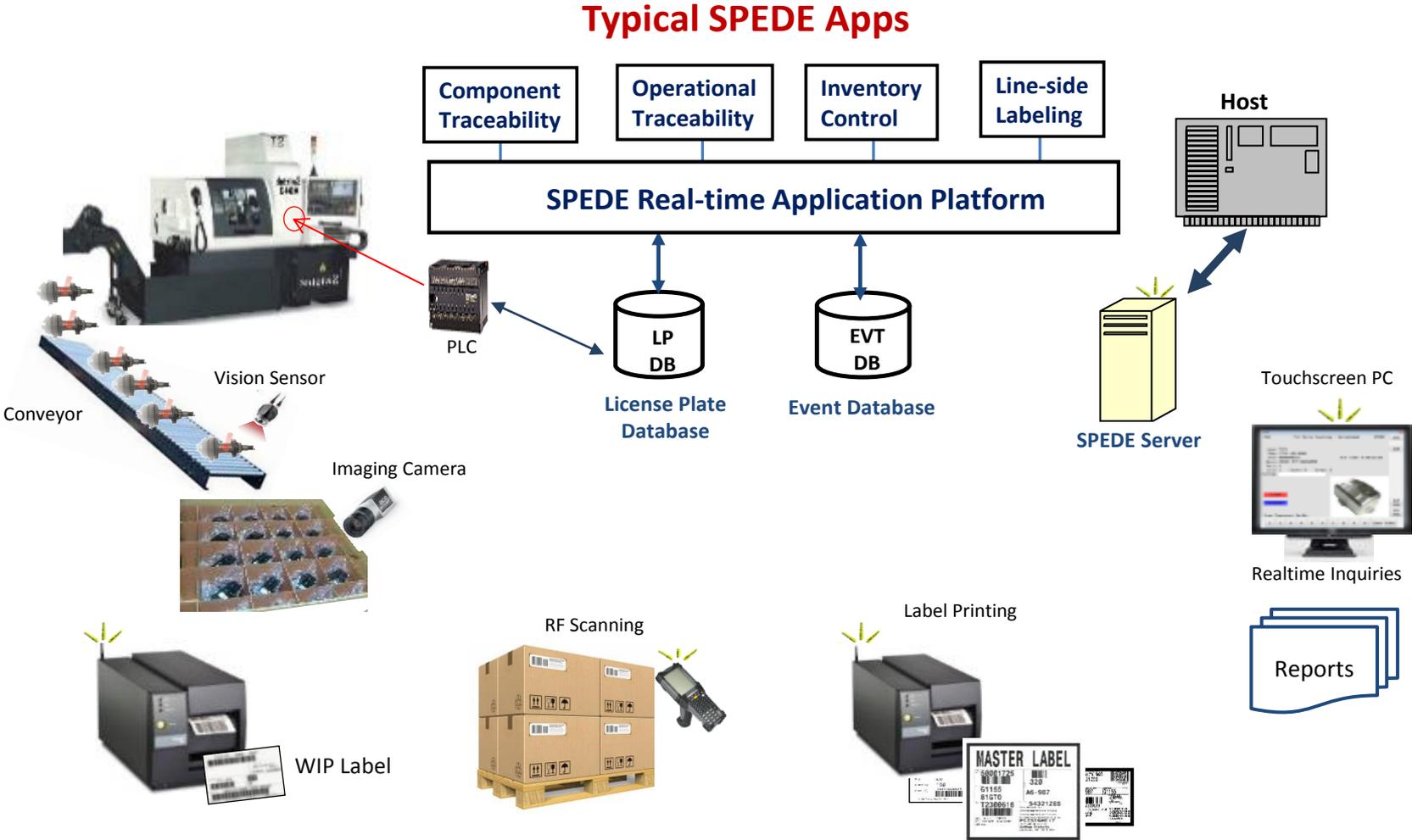
SPEDE Traceability Functionality ...

1. Trace Parts, Components and/or WIP Operations
2. Real-time Inventory functions
3. Automated Line-side Labeling
4. Real-time production information displayed at line-side to improve efficiency
5. Production reports, Inventory and Traceability inquiries
6. Updates to host ERP and OEE systems

Printed By: Dan Worthington Report Date: 01/08/2013 Report Time: 08:35:00 Page: 1 of 1							
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



SPEDE Platform Applications and Interfaces



Component Traceability

Use Handheld or Vehicle Mount Scanner

SPEDE Bill of Material

- By WIP/FG part number
- List of components / purchased items per part
- Quantity per operation
- Set-up is via SPEDE Web application



SPEDE Touchscreen PC

Receive Raw / Purchased Components

- Use vendor supplied labels
- Optionally print SPEDE labels by unit of measure issued
- Use Handheld or Vehicle Mount Scanner to record

Issue Components to Line/Operation

- Scan component attributes - part number, vendor lot,
- Component part is validated to BOM / Line

Optional Return to Stock

- Unused
- To be reissued
- Use prior serial or generate new

Component Traceability

Tracking Components

- SPEDE stores finished part BOM
- Lot codes enter per component
- Component lots tied to container serial number
- Inquire by component part/lot to see containers
- Inquire by container serial number to see component lots

The screenshot shows a web browser window displaying the SPEDE Component Serial Tracking application. The page title is "SPEDE Component Serial Tracking" and the URL is "192.168.0.98/SPDPLC.net/REPORTS/SPD_COMPONENT_SERIAL_TRACKING_WEB.ASPX". The application header includes the SPEDE Technologies logo, the company name, and a "Logout" link. A navigation menu is visible below the header, with "SPEDE Reports" selected. The main content area displays the search results for the component serial number "840906 A1-FU xxx1727".

Enter a Component Serial Nbr:

Part Nbr: 8409060000099999
 Part Desc: 2HX CONSOLE ASSY, CTR
 Cust Part Nbr: 83400-TLA -A118-M1
 Last Container: 20232022-00007661

Details found for Component Serial Nbr: 840906 A1-FU xxx1727

Carton SerNbr	Run Nbr	Production Run Nbr	Line Nbr	Status	Empl Nbr	Insert Date	Source	Reason	Component SerNbr
20232022-00007661	1000001991	1000001991	TGMO		bds	1/9/2017 5:13:34 PM	PLC		840906 A1-FU xxx1727

Operations Traceability

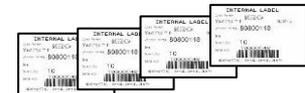
SPEDE Routing by WIP/FG part number

- List of operation sequence
- Sequence can be fixed by part number (1, 2, 3, 4, 5)
- Sequence can be dynamic by part set up (1, 2, 4, 3, 5)
- Set up via SPEDE Web application



SPEDE WIP Labeling at each Operation

- Operator sign-on
- Start of Run
- Verify issued components
- Print Labels
- PLC integrated counts
- Includes HMI, printer, barcode scanner
- Optional Vision Sensor
- Weigh Count



Prints WIP Label with:

- Part, description/operation, date-time, operator, lot, next operation, serial number
- Issue to next operation

Operational Inquiries:

- By part, Operation, Our Lot, Vendor Lot, Location, FIFO date, Operator

Inventory Traceability

Inventory Functions

Hold

- By part
- By vendor lot
- By serial number



Scrap

- By part
- By vendor lot
- By serial number

Move Transaction

- Scan WIP Serial, To Location
- Locations can be free or fixed to product category

Inquiries

- By Part Number
- By Our Lot
- By Vendor Lot(s)
- By Operation

Cycle Count

Physical Count

WIP Area

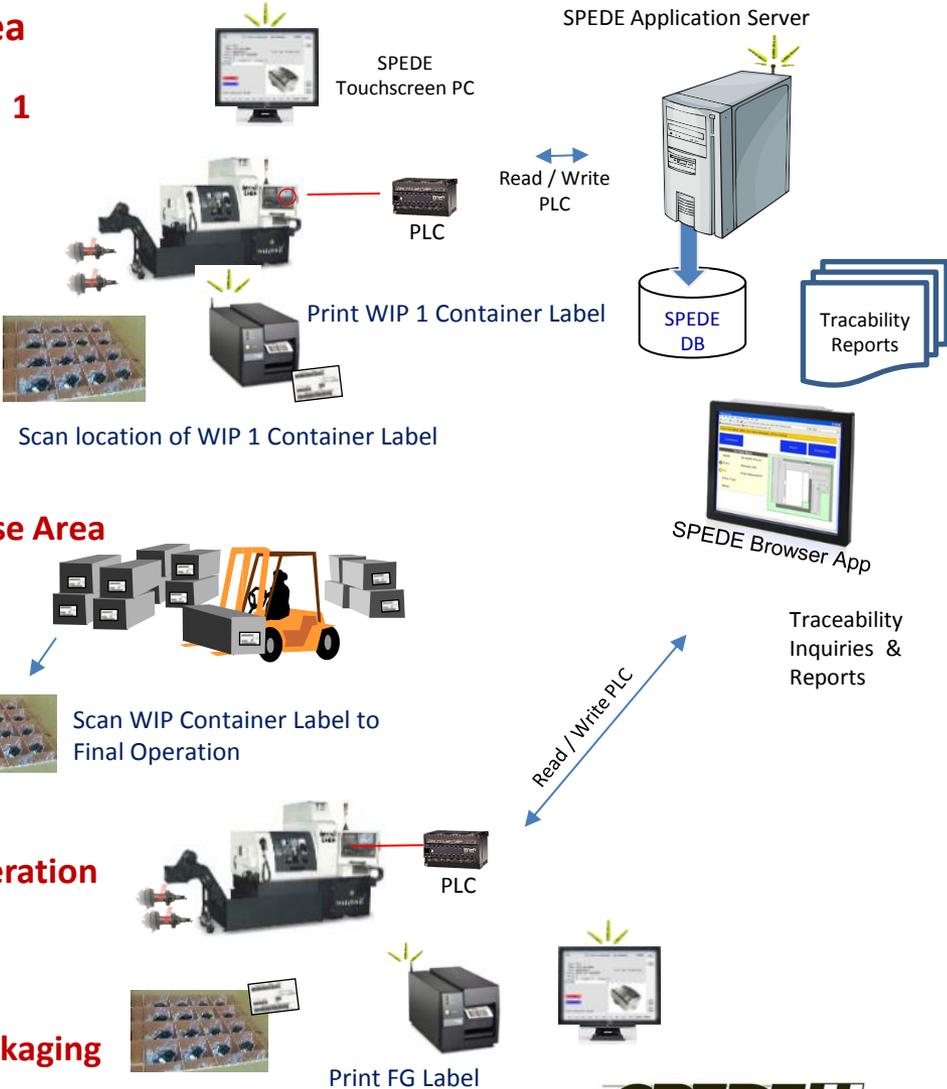
Operation 1

Work Flow

Warehouse Area

Final Operation

Final Packaging



Line-side Labeling at Final Operation

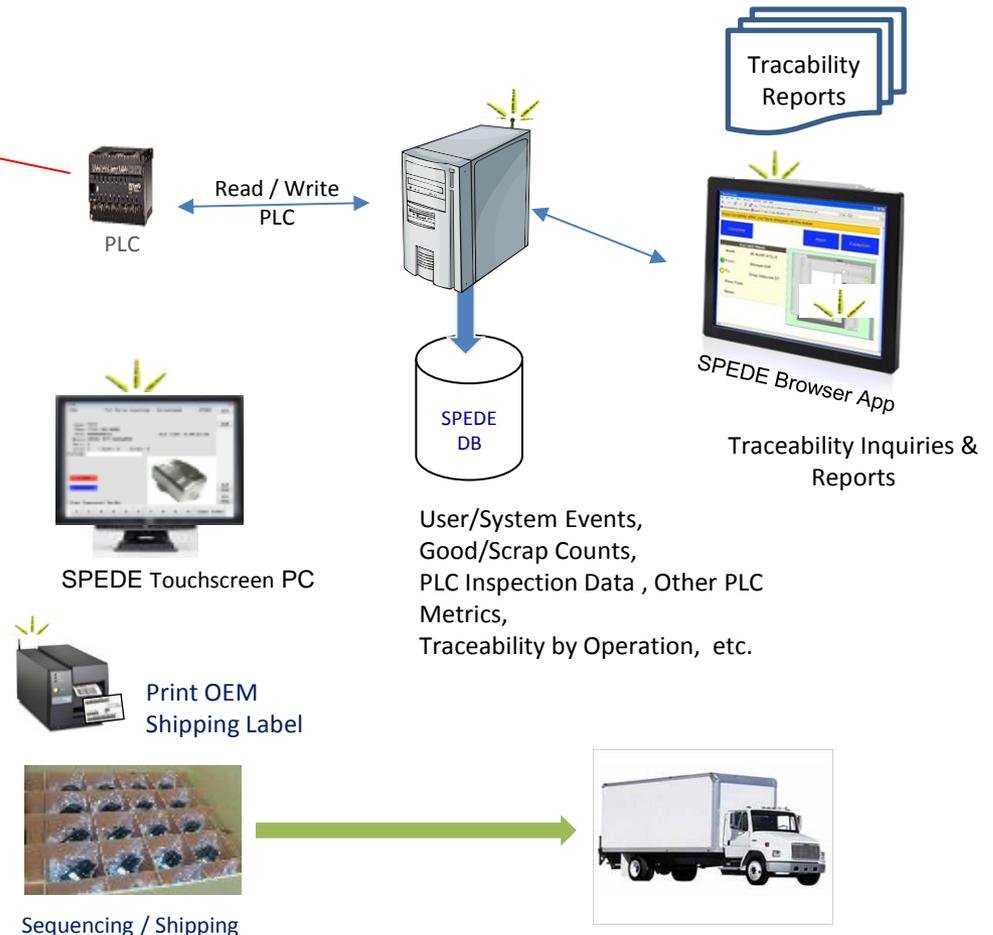
Final Operation Area



IT Area

Finished Goods/End Item Line Side Labeling

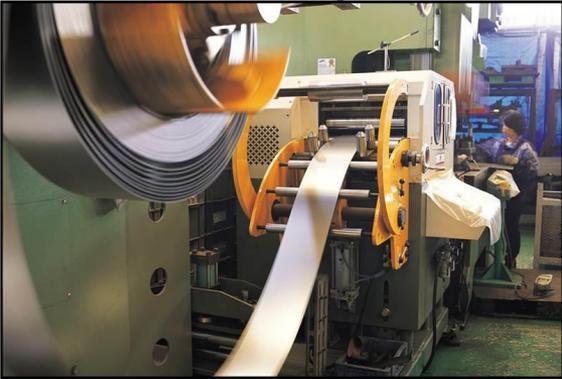
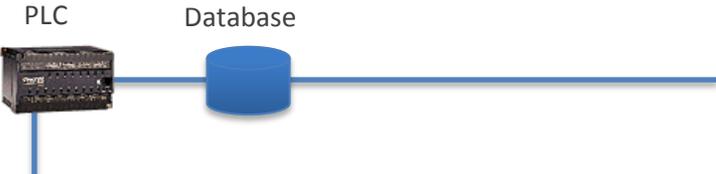
- Count parts and print customer label
- HMI, printer, barcode scanner
 - By Start of Run – any part
 - By EDI/Customer Orders
 - By internally generated schedule
- Serialized parts are tied to customer container labels
- WIP components issued to finishing operation
- WIP operations and components are tied to WIP components
- Finished Good container labels are tied to both



Traceability Reporting

SPEDE can link a Part to:

- PLC Cycle ID or Record ID
- Production Machine, Run Date, Shift, Serial Nbr, QC Status, etc.
- Optional: Container Serial Number(s) the Part was packed in
- Optional: All other Serialized Parts in a generalized Container



Sample Production Data:

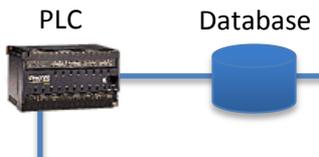
- Part Number
- Operator Nbr
- Shift, Date, Time
- WO Nbr
- Lot Nbr
- Machine Cycles, Cycle Timestamp
- Part Count: Good, Scrap, Re-work
- Machine Stats & Metrics, etc.

Sample Traceability Detail Report

From DateTime 2016/04/02 08:00:00 To 2016/04/02 09:00:00 by Serial Nbr

Machine IP	Date	Time	Line	Shift	Part Nbr	Part Description	Serial Nbr	Record ID	Op Nbr	QC
10.17.17.150	4/2/16	8:01:30	1	A	95011AL0	Camshaft	191734	43676	61	P
10.17.17.151	4/2/16	8:02:30	1	A	95011AL0	Camshaft	191734	43686	70	P
10.17.17.80	4/2/16	8:03:30	1	A	95011AL0	Camshaft	191734	43687	81	P
10.17.17.186	4/2/16	8:04:30	1	A	95011AL0	Camshaft	191734	43688	100	P
10.17.17.84	4/2/16	8:05:30	1	A	95011AL0	Camshaft	191734	43690	105	P
10.17.17.86	4/2/16	8:06:30	1	A	95011AL0	Camshaft	191734	43692	120	P

Supervisory Reporting & Analytics



- 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.

SPEDE Data and Crystal Reports

- SPEDE provided reports or
- Customer created

Sample Manufacturing Metrics Report

	OEE %	Earned DL Hrs	Actual DL Hrs	Net Var.	Labor Prdvty %	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>(\$) Finished Scrap \$</u>	<u>(\$M) 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	

	OEE %	Earned DL Hrs	Actual DL Hrs	Net Var.	Labor Prdvty %	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>(\$) Finished Scrap \$</u>	<u>(\$M) 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	

Meet a Few of our Customers...



Driven by performance



BOSCH

To Discuss Your Line-side Project...

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About Us:

SPEDE Technologies is a software and systems company with 39 years of experience in the automotive industry. We specialize in Automated Line-side Solutions that control and standardize production area processes to ensure consistent accuracy, increase efficiency and provide 20/20 visibility into line-side operations.

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

