Component & Operations Traceability with Inventory and Line-side Functions

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Overview of SPEDE Traceability Solutions

1. Traceability is Created Automatically via Scanning Transactions
2. Traces Parts, Components, WIP Operations
3. SPEDE Traceability Solutions can include:
    1. Real-time Inventory functions
    2. Automated Line-side Labeling
    3. Real-time Production information at line-side to improve efficiencies
    4. Production Reports, Inventory and Traceability inquiries
    5. 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

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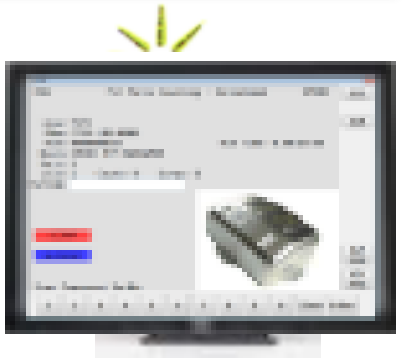
Component Traceability

Can Use a Handheld or Vehicle Mount Scanner



SPEDE Touchscreen PC at Lineside

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

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

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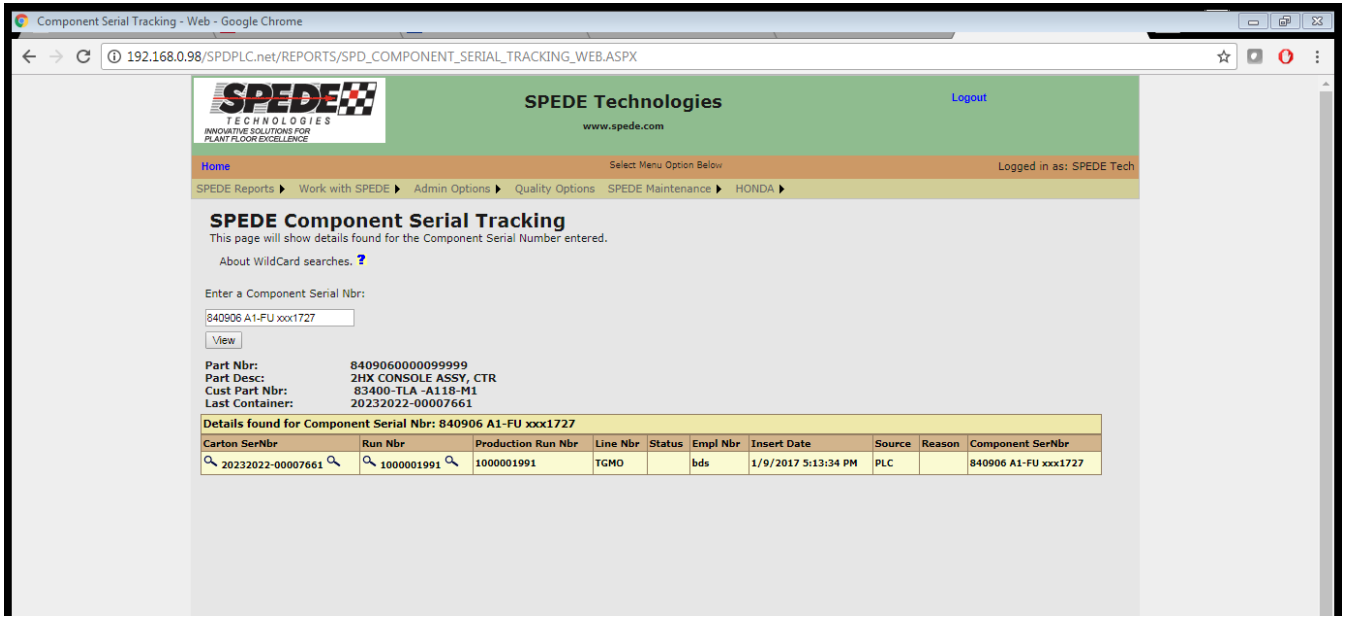
Component Traceability

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



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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
- Walk up and print
- 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

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Inventory Traceability

Inventory Functions

Hold
- By part
- By vendor lot
- By serial number

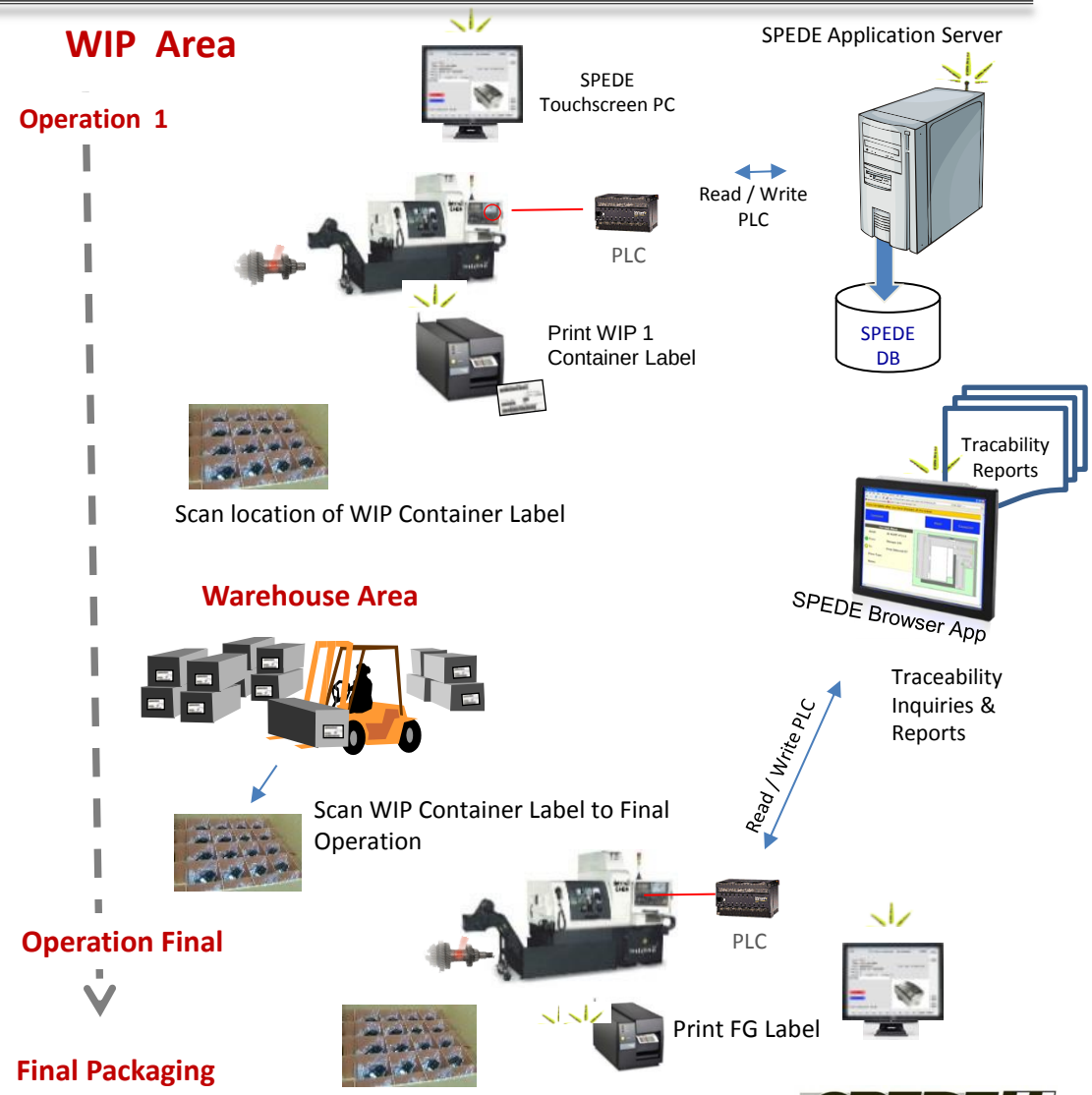
Scrap
- By part
- By vendor lot
- By serial number

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



Line-side Labeling at Final Operation

Final Operation Area

PLC

Read / Write
PLC

IT Area

Tracability Reports

SPEDE Browser App

Traceability Inquiries & Reports

SPEDE DB

User/System Events,
Good/Scrap Counts,
PLC Inspection Data , Other PLC Metrics,
Traceability by Operation, etc.

SPEDE Touchscreen PC

Print OEM
Shipping Label

Sequencing / Shipping

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 aretied 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

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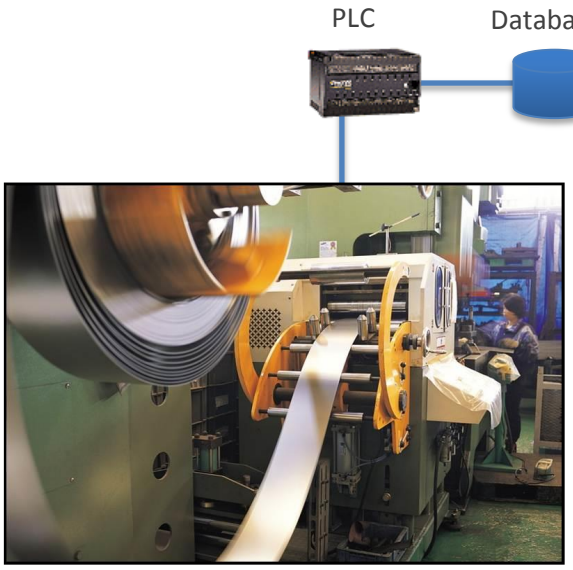
Traceability Reporting

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:

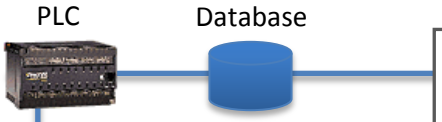
- Part Number
- Operator Nbr
- Shift, Date, Time
- WO Nbr
- Lot Nbr
- Machine Cycles, Cycle Timestamp
- Part Count: Good, Scrap, Re-work
- Machine Stats & Metrics, etc.

Sample Traceability Detail Report

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

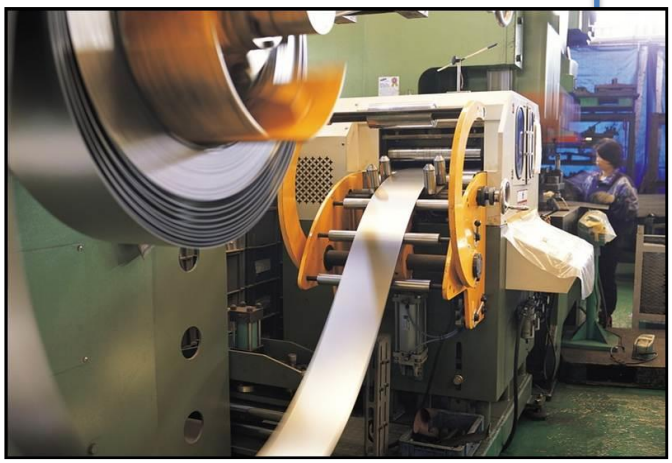
Machine IP	Date	Time	Line	Shift	Part Nbr	Part Description	Serial Nbr	Record ID	Op Nbr	QC
10.17.17.150	4/2/16	8:01:30	1	A	95011AL0	Camshaft	191734	43676	61	P
10.17.17.151	4/2/16	8:02:30	1	A	95011AL0	Camshaft	191734	43686	70	P
10.17.17.80	4/2/16	8:03:30	1	A	95011AL0	Camshaft	191734	43687	81	P
10.17.17.186	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 Manufacuring 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%

Total Parts	Good Parts	Scrap Parts	Available Time	Unscheduled Down Time	Machine Hours Worked	Actual Downtime Hours	Earned Machine Hours
28,304	27,583	721	261	20.05	229.42	66.02	223.53

Actual Man Hours	Man Hour Downtime	(S) Finished Scrap $	(SM) Misc Scrap $	(I) In-Proc Scrap $	Total Scrap $
770	242	$4,035.74	($59.51)	$2,076.35	$6,052.58

	Utilization %		Good Part %		Machine Efficiency %	Total Production $
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%

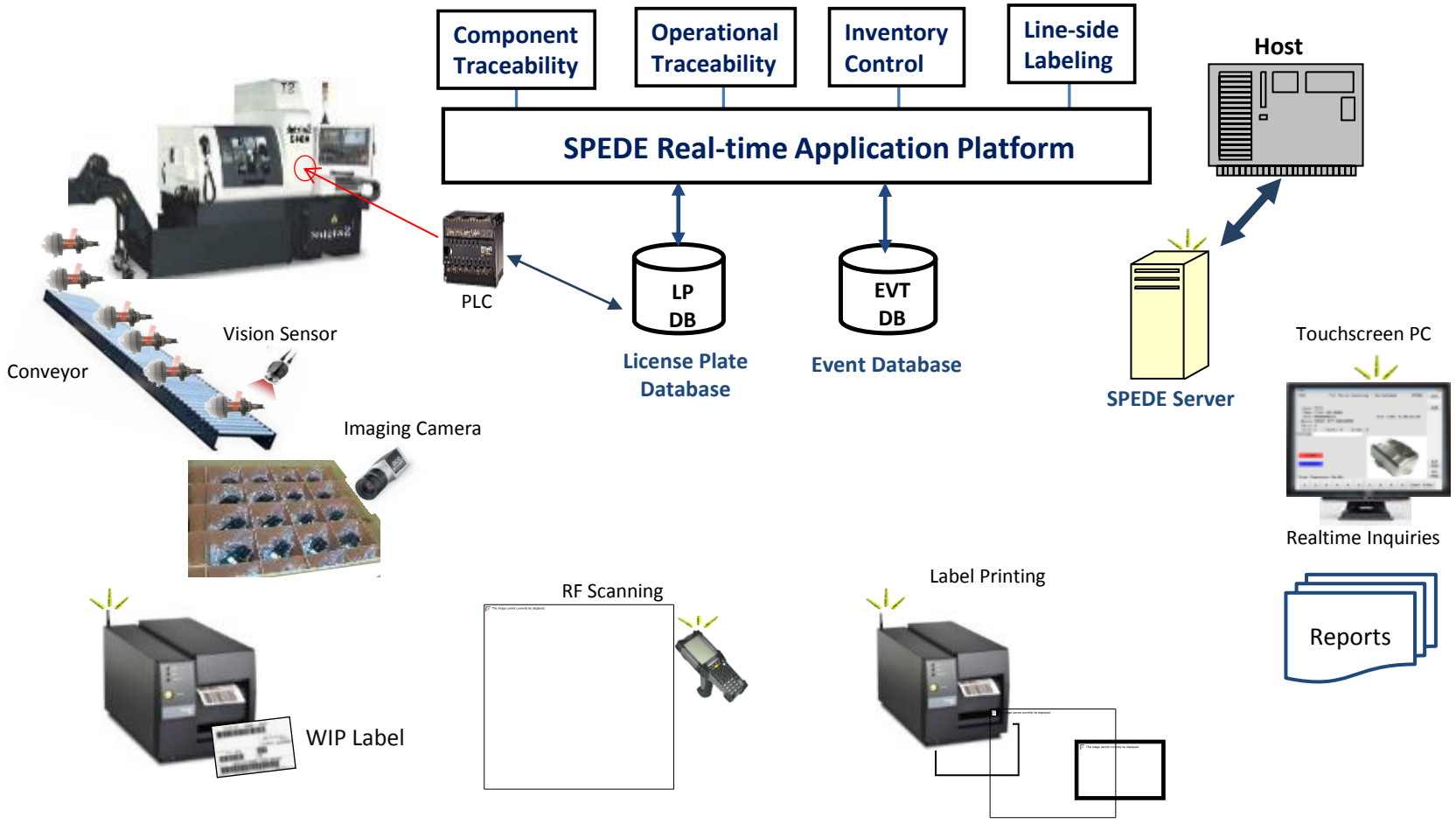
Total Parts	Good Parts	Scrap Parts	Available Time	Unscheduled Down Time	Machine Hours Worked	Actual Downtime Hours	Earned Machine Hours
885	880	5	21	2.92	17.28	6.72	20.11

Actual Man Hours	Man Hour Downtime	Shift Count	(S) Finished Scrap $	(SM) Misc Scrap $	(I) In-Proc Scrap $	Total Scrap $
121	47	3.00	$253.62	$0.00	$108.44	$362.06

	Utilization %		Good Part %		Machine Efficiency %	Total Production $
OEE Factors:	82.3%	*	99.4%	*	116.4%	$44,890.02

SPEDE Platform Applications and Interfaces

Typical SPEDE Apps



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Meet a Few SPEDE Customers...

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To Discuss Your Line-side Project...

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About Us:

SPEDE Technologies is a software and systems integration company with 40+ years of experience in the automotive and manufacturing industries. We specialize in Automated Line-side Solutions that control and standardize production area processes to prevent errors, increase efficiency and provide 20/20 visibility into line-side 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. 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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