



Cogiscan
* Track Trace Control

Your
competitive
edge

Introduction to Cogiscan

- Industry leadership: in Track, Trace, & Control (TTC) & Connectivity solutions for electronics manufacturing
- Founded in 1999; 20 years of innovation in electronics manufacturing
- Global company, headquartered in Bromont, CA (near Montreal)
- Over 250 customers w/ more than 420 factories worldwide
- Trusted partner of equipment & SW providers
- Multiple patents and industry awards



FROST & SULLIVAN

Some of our customers...

Raytheon

BAE SYSTEMS

**Rockwell
Collins**

**NORTHROP
GRUMMAN**

CREE 

 **LUTRON**

DELPHI

 **ALPINE**

LITEON


General Motors

flex **JABIL**

 **ASTEELFLASH**
YOUR EMS PARTNER

FOXCONN

Pioneer

 **FANUC**

 **NEWSAN**

Continental 

TRW
Automotive
fuba
Automotive Electronics



Celestica 
SANMINA

SAMSUNG

 **DOLBY**

 **Visteon**



BOSCH

Siix
We care.

Schneider
 **Electric**

TTC APPLICATIONS

MATERIAL & PROCESS CONTROL

Machine Control
Material Control
MSD Control
Packing Control
LED Binning Control

TRACEABILITY

Traceability Module

ANALYTICS

Factory Intelligence Real-Time
Factory Intelligence Analytics

CONNECTIVITY

Co-NECT machine interface
PFC and CSC

DATA MANAGEMENT

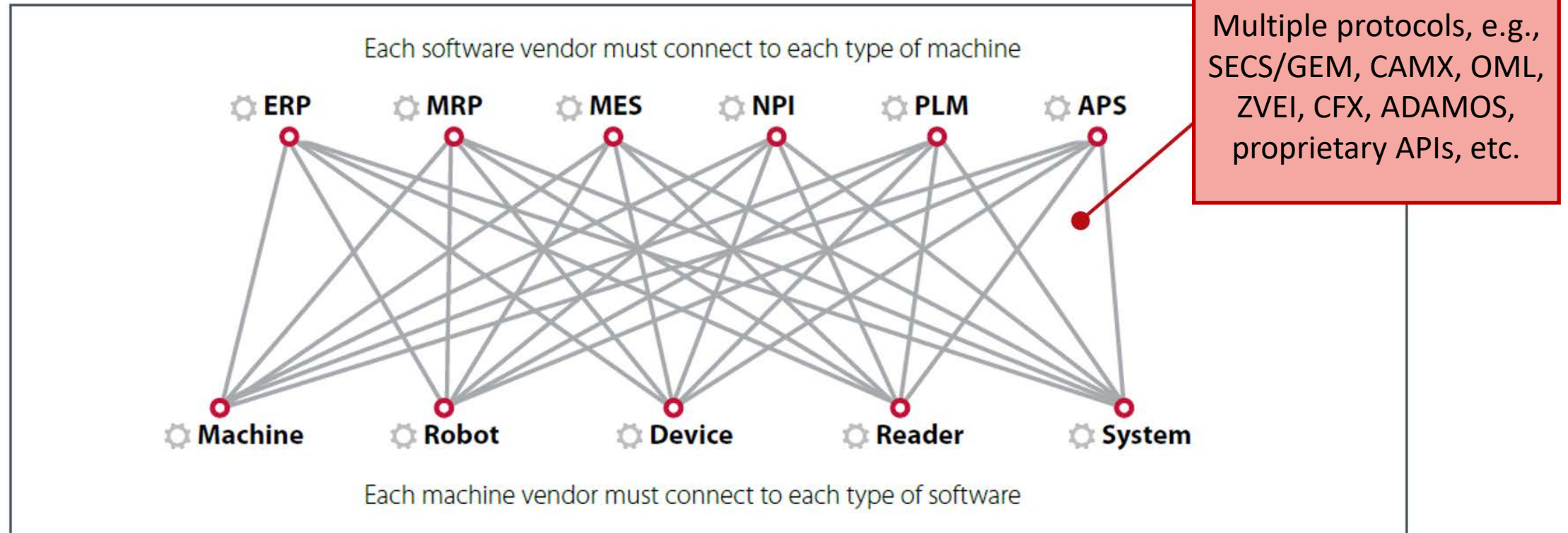
TTC Server
Open Interface
MES Connection License

Solution Offering

- **TTC Applications:**
 - Material & Process Control
 - Traceability
 - Analytics
- **Connectivity & Data Management:**
 - Co-NECT platform for machine data collection
 - Data Management solutions for data contextualization and storage
 - Enterprise interfaces for integration with MES, ERP, etc.

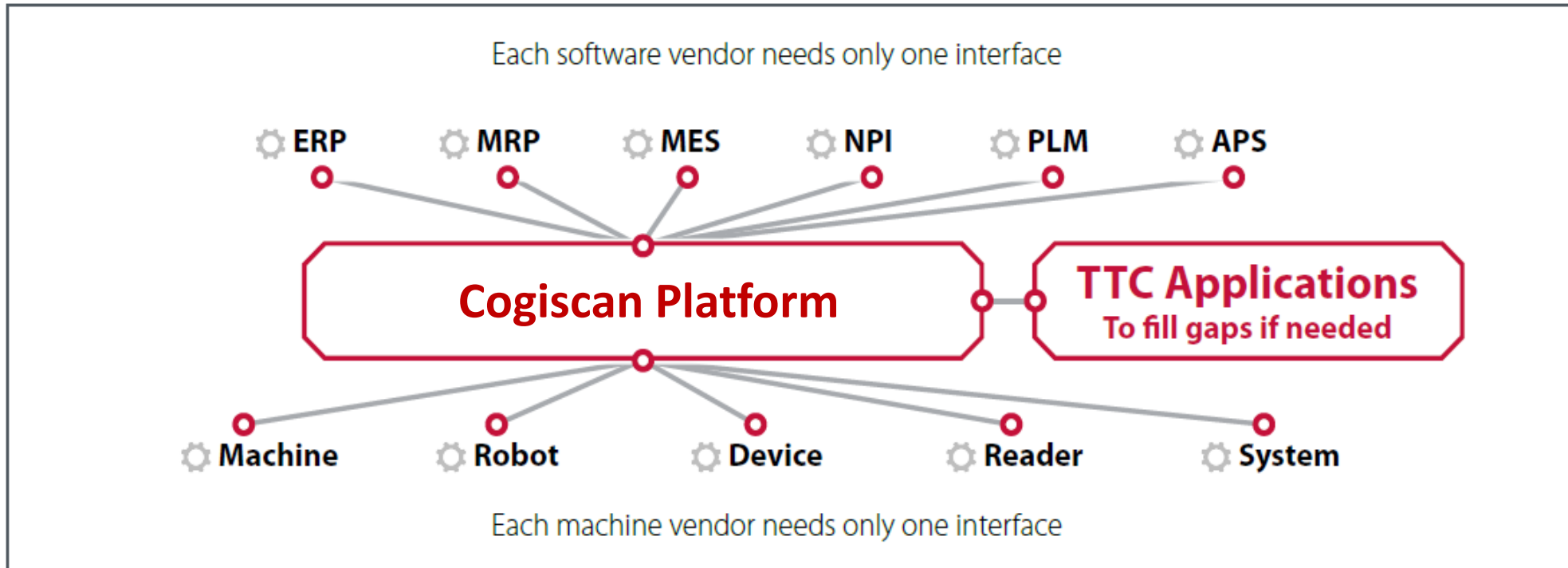
Connectivity Solutions

Current Situation



Connectivity Solutions

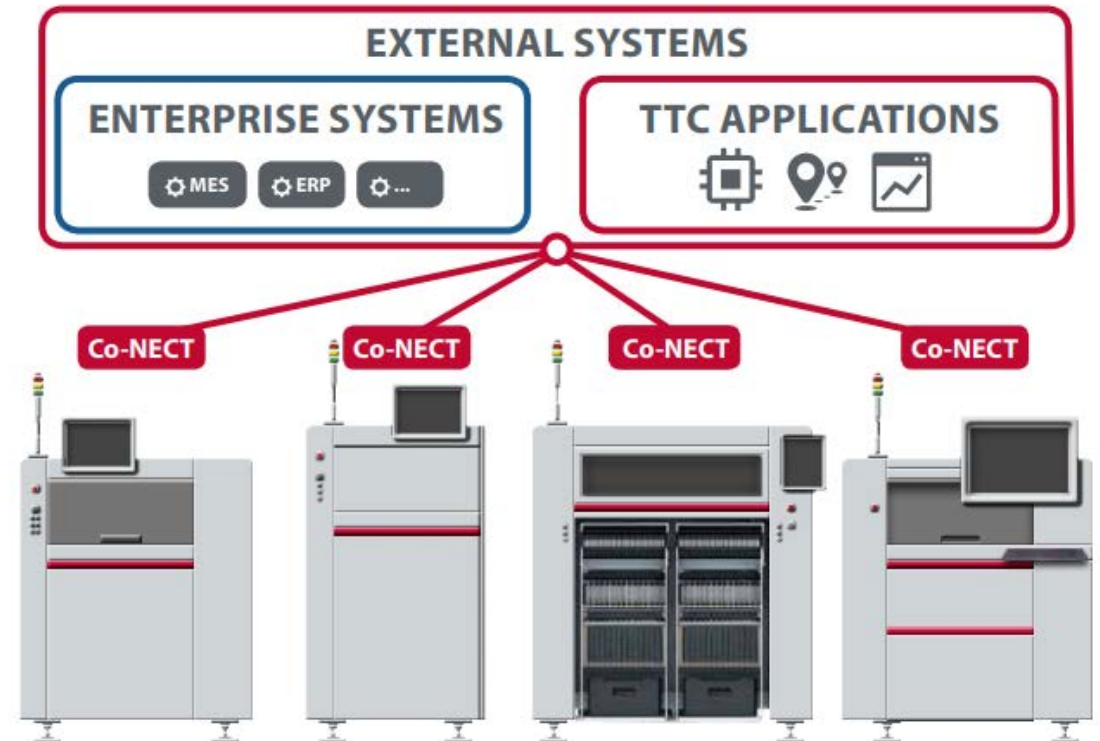
Single Connection Point with Cogiscan Platform



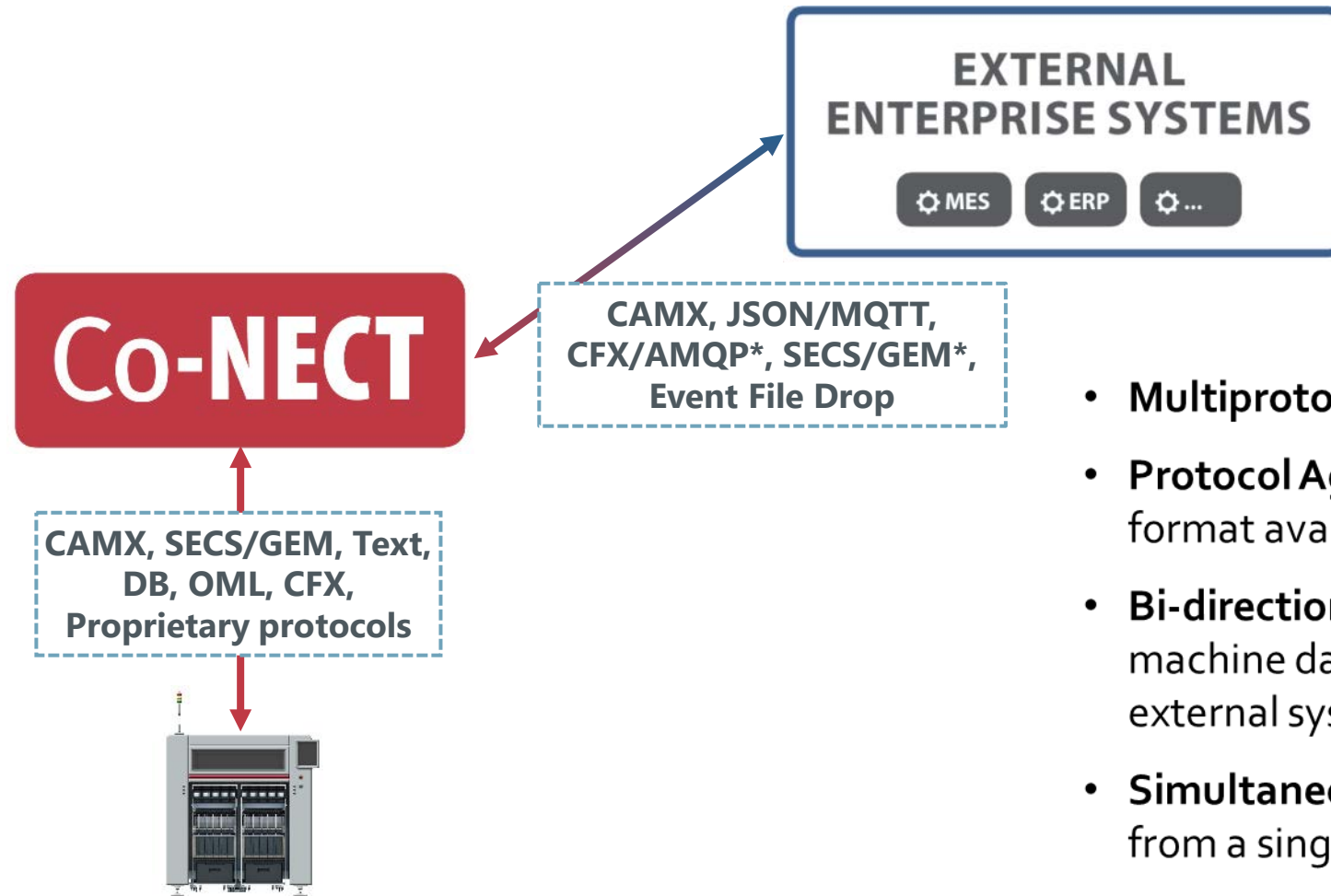
Co-NECT Machine Integration

Direct interface with > 50 brands of assembly equipment

- Incl. laser mark, labeling, paste printers, dispensers, placement machines, reflow ovens, SPI, AOI, in-circuit test, functional test, material storage systems, wave / selective solder, x-ray inspection, LCR meters
- Vast library of specialized interfaces for each machine type, supporting hundreds of equipment models
- New adapters added regularly
- Benefit: automate, standardize and centralize machine data collection



Co-NECT How it works



- **Multiprotocol:** for both data input and output
- **Protocol Agnostic:** collects any machine data format available
- **Bi-directional communication:** receives machine data input and takes commands from external systems back to connected machines
- **Simultaneous output:** multiple protocols sent from a single interface

Co-NECT Data collection

Machine Type	Data Collected **
Printer	Program Name, Process Data, Machine State, Paste Verification, Traceability Data
SPI & AOI	Program Name, Test Results, Defect Data, Traceability Data
Placement Machine	Recipe, Program Name, Changeover Request, Machine State, Reference Designator Info., Material Tracking, Low Level Warning, Feeder Load-Unload Events, Board Start Event, Mispick Events, Feeder Location, Traceability Data
Oven	Program Name, Process Control, Machine State, Traceability Data
Wave & Selective Solder	Program Name, Process Data, Automatic Changeover, Traceability Data
Inventory Storage Tower	Raw Material Initialization, Material Deletion, Material Quantity Updates, Material Load & Unload, Automatic Material Request

The Industry's Largest Library of SMT Machine Interfaces

(Partial Listing)



Inspection & Test



Material Storage &



Marking/Labeling



Printer / Dispenser



Placement



Reflow / Solder

Co-NECT OEM partnerships

The logo for JUKI, consisting of the word "JUKI" in a bold, blue, sans-serif font.

"We look to Cogiscan to help us be that connectivity for a lot of our interfaces. We use them for our intelligent feeder system, and they've developed the 'Co-NECT' software that allows us to connect to storage towers, and also now with CFX." **Bill Astle, President & CEO**

"In addition to CFX, Universal relies on the Co-NECT platform to support other required protocols, such as CAMX or SECS/GEM, as well as customer-specific integration requirements." **Todd Vick, Director of Marketing**

The logo for Universal Instruments, featuring a blue circular icon with a stylized 'U' and the text "Universal Instruments" in a blue, sans-serif font.The logo for MIRTEC, featuring the word "MIRTEC" in a bold, orange, sans-serif font, with a stylized orange and white starburst icon to the right.

"The reason why we chose Cogiscan is that there are so many standards out there, that there is no real standard. We need to communicate with all machines..." **Brian**

Co-NECT OEM partnerships



“By collaborating with Cogiscan we are able to implement their robust off-the-shelf Co-NECT interfaces for all major brands of SMT equipment, so our customers can easily integrate our solutions within any production environment.” **Matteo Padoan, COO**

“Keysight’s PathWave ...combined with Cogiscan’s Track, Trace and Control solutions enables data collection and acquisition throughout the entire electronics PCBA manufacturing line...” **Daniel Mak, Sr. R&D Director**



“For me, the key strengths of Cogiscan are service, technology, and quality... In our drive to Industry 4.0, we think having Cogiscan as a partner is absolutely essential.” **Mark Clemons, Business Unit Manager - Printers**



Material Control: Benefits

- **Reduce waste** by eliminating unnecessary movement of material, tools and employees
- **Optimize production performance** by minimizing line downtime and improving line changeover time
- **Improve quality** by guaranteeing the correct components and process conditions are used
- **Reduce inventory costs** through accurate material consumption data in order to prevent unnecessary procurement of material

//

We now know exactly where every component is located, so we don't have to go look and search for lost or misplaced components.

//

Paul Jaussi, Manufacturing Engineering Manager at Biamp Systems

Material Initialization & Labeling

Register and label incoming material for full tracking and control throughout its lifecycle

Features:

- Integration with customer ERP, MRP or MES
- Generate common internal label for use throughout the factory, esp. SMT
 - Cogiscan- or customer-defined labels
- Generate or assign unique IDs for tracking of individual material containers (reels, etc.)

Benefits:

- Fully identify material for traceability, location & quantity tracking, single-scan operations, MSD control, etc.
- Avoid duplication of data entry
- Reduce risk of human error in labeling of material





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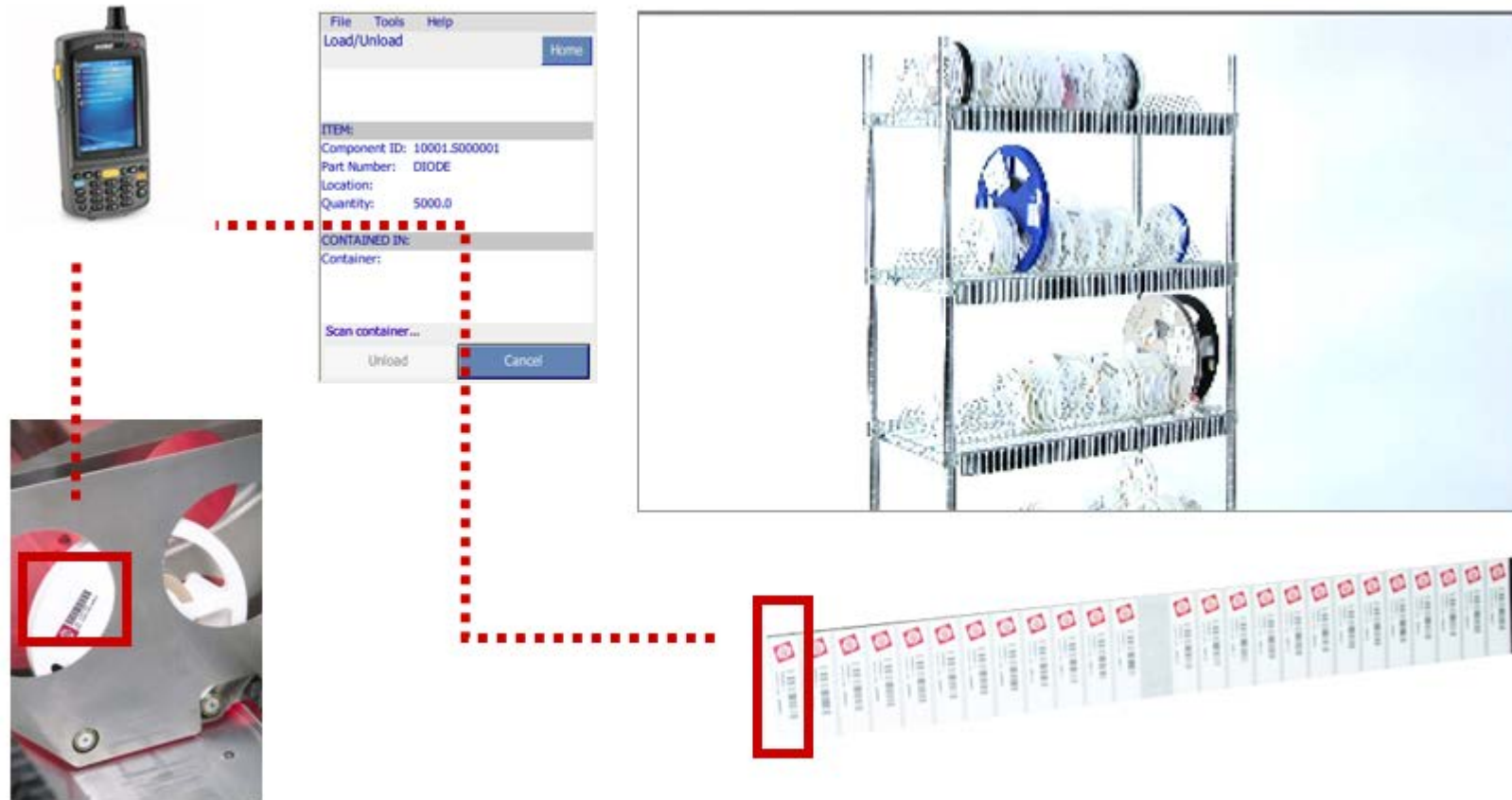
We now know exactly where every component is located, so we don't have to go look and search for lost or misplaced components.

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Paul Jaussi, Manufacturing Engineering Manager at Biamp Systems

Inventory Tracking

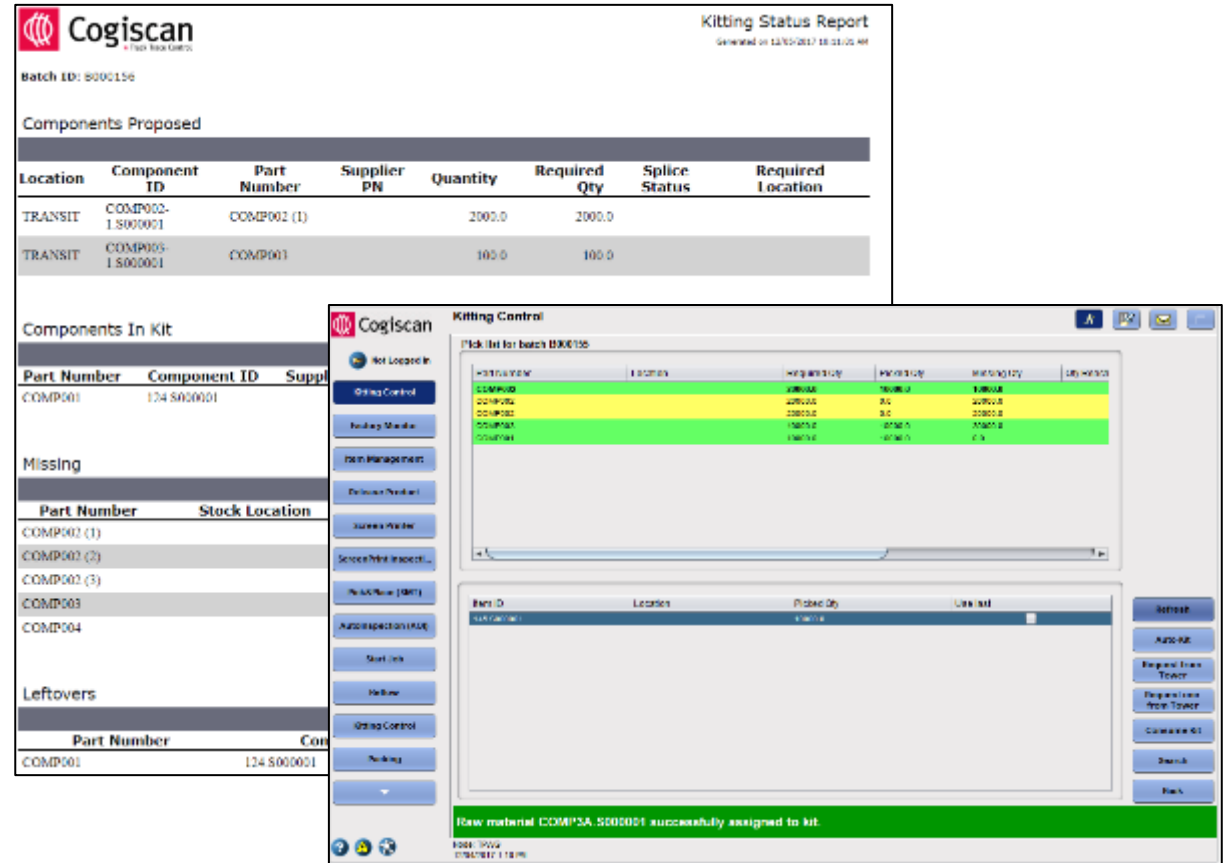
Material to Location



Kitting Control

Automate and error-proof material kitting for production jobs

- Improve the kitting process by verifying:
 - Material shortages prior to production
 - Automatic reservation of material to the assigned kit
 - No accidental use of unauthorized material
 - FIFO rules are followed
 - Required quantity of components are available for job completion
 - Automatic pull requests will be sent to the Storage Tower



Cogiscan Kitting Status Report
Generated on 12/05/2017 18:00:00 AM
Batch ID: 8000156

Components Proposed

Location	Component ID	Part Number	Supplier PN	Quantity	Required Qty	Splice Status	Required Location
TRANSIT	COMP002-1 S000001	COMP002 (1)		2000.0	2000.0		
TRANSIT	COMP003-1 S000001	COMP003		100.0	100.0		

Components In Kit

Part Number	Component ID	Supplier
COMP001	124 S020001	

Missing

Part Number	Stock Location
COMP002 (1)	
COMP002 (2)	
COMP002 (3)	
COMP003	
COMP004	

Leftovers

Part Number	Component ID	Supplier
COMP001	124 S000001	

Cogiscan Kitting Control
Pick list for batch B00156

Material Name	Location	Required Qty	Splice Status	Required Location	Qty
COMP002	TRANSIT	2000.0	OK	TRANSIT	2000.0
COMP003	TRANSIT	100.0	OK	TRANSIT	100.0
COMP004	TRANSIT	100.0	OK	TRANSIT	100.0

Batch ID: Location: Picked Qty: Unit list

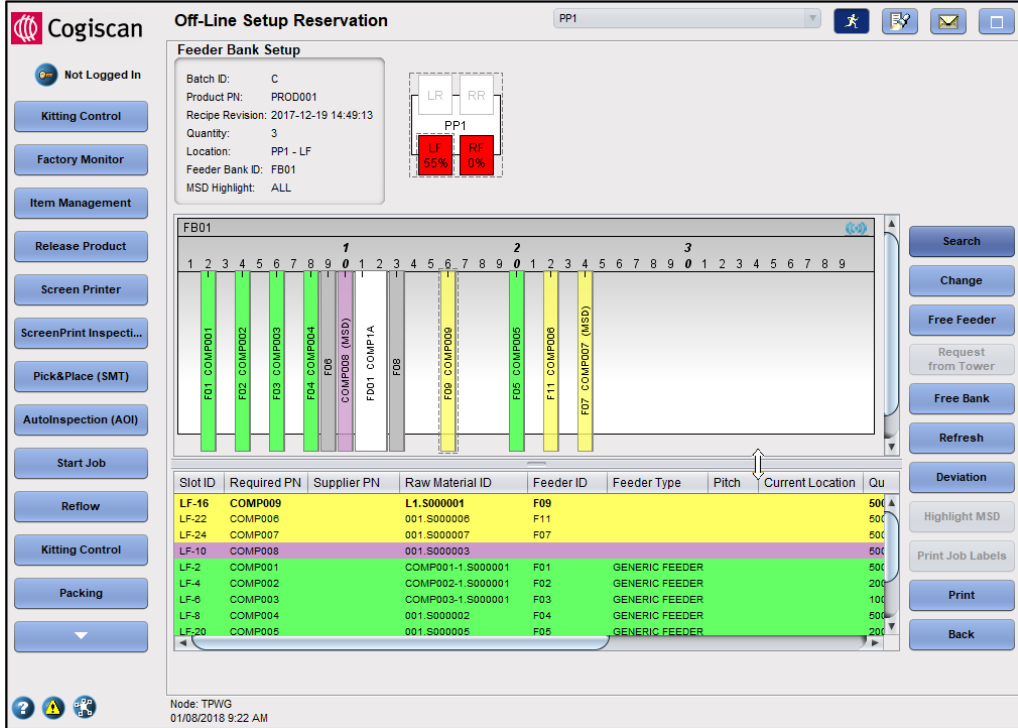
Refresh
Auto Kit
Request from Tower
Request from Free Tower
Calculate Kit
Search
Print

Raw material COM13A 500001 successfully assigned to kit.
Batch ID: 8000156
Generated on 12/05/2017 18:00:00 AM

Setup & Process Control Module

Rest assured you're always running the correct process

- Line level solution for set-up validation on SMT machines as well as manual processes
- Validates every element including:
 - Components
 - Tooling, incl. feeders
 - Consumables
 - Machine program
- Flexible configuration options:
 - Setup validation with a common interface
 - Optimized step-by-step operator instructions
 - Both offline and online machine setup validation

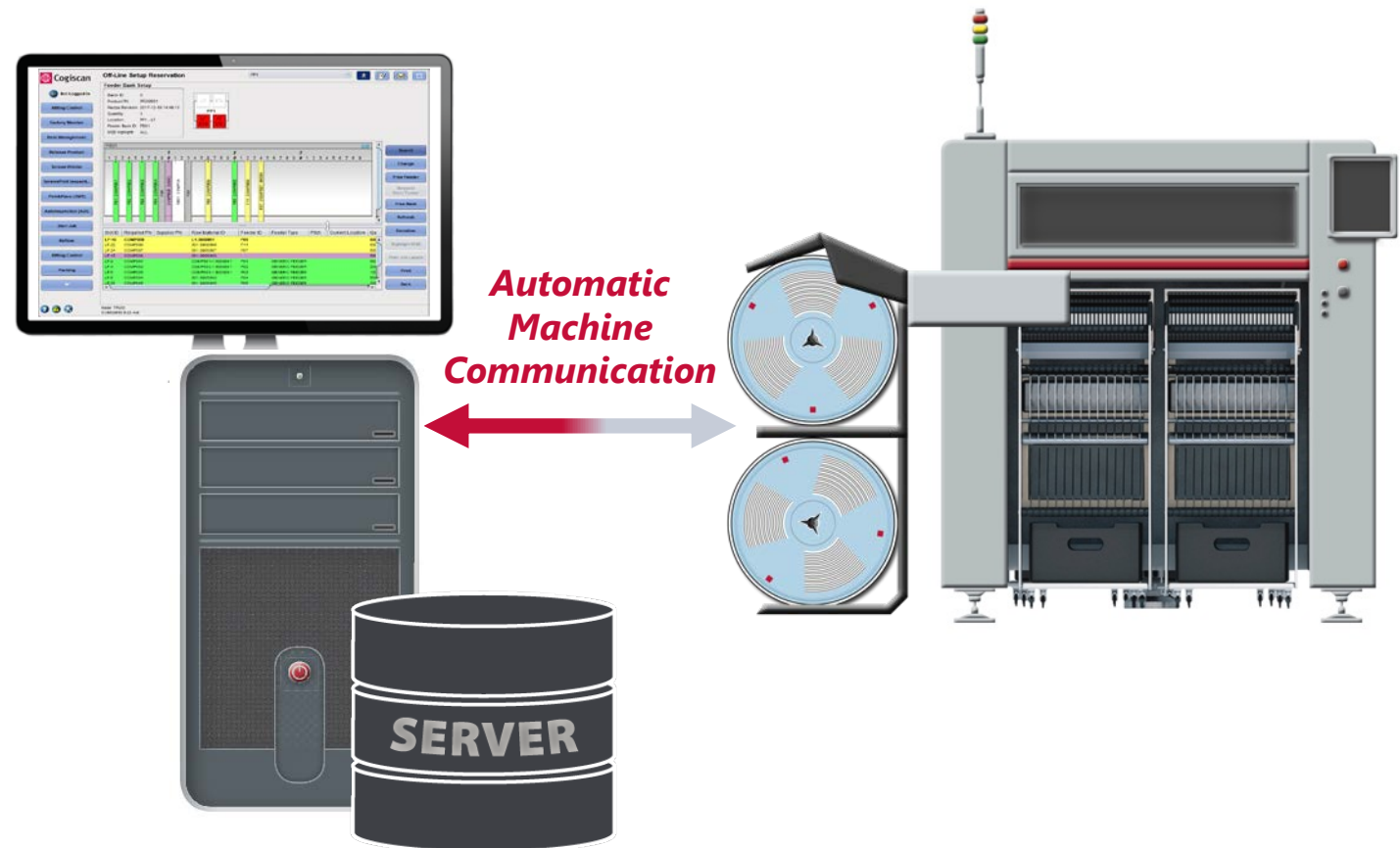


Slot ID	Required PN	Supplier PN	Raw Material ID	Feeder ID	Feeder Type	Pitch	Current Location	Qu
LF-16	COMP009		L1.S000001	F09				50
LF-22	COMP006		001.S000006	F11				50
LF-24	COMP007		001.S000007	F07				50
LF-10	COMP008		001.S000003					50
LF-2	COMP001		COMP001-1.S000001	F01	GENERIC FEEDER			50
LF-4	COMP002		COMP002-1.S000001	F02	GENERIC FEEDER			20
LF-6	COMP003		COMP003-1.S000001	F03	GENERIC FEEDER			100
LF-8	COMP004		001.S000002	F04	GENERIC FEEDER			50
LF-20	COMP005		001.S000005	F05	GENERIC FEEDER			20

Setup Control Module

Flexible configuration options available to support any machine type

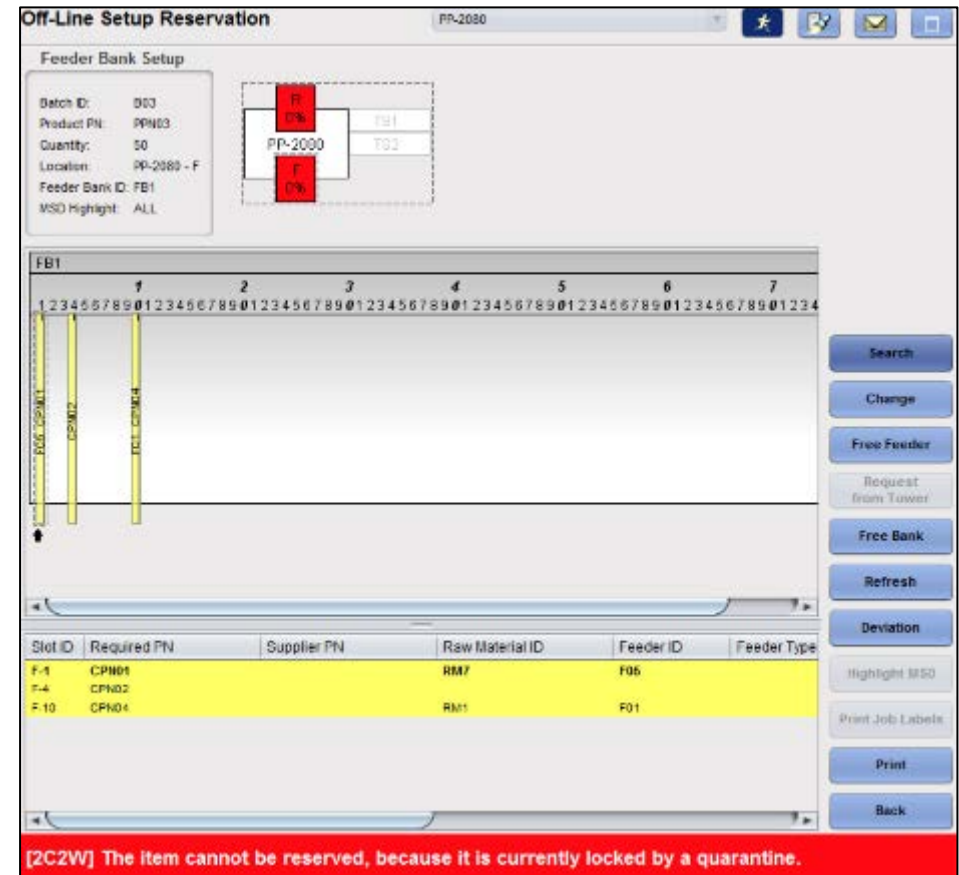
- A simple and low-cost barcode-based solution for legacy machines without smart feeders:
- For machines with smart feeders, the *Co-NECT* machine interface is used to harvest feeder event data:
 - Setup performed by either Cogiscan or machine vendor's software – all data will be synchronized directly within *TTC Server*



Quarantine Control

Ensure products will not be built with unwanted or defective materials

- Blocks any quarantined materials from being used
- Prevents the usage of quarantine components during both online and offline set-up
 - Components are "LOCKED"
- Includes automatic alarms to help stop production if any machines are loaded with quarantined materials



Slot ID	Required PN	Supplier PN	Raw Material ID	Feeder ID	Feeder Type
F-1	CPN01		RM7	F06	
F-4	CPN02				
F-10	CPN04		RM1	F01	

[2C2W] The item cannot be reserved, because it is currently locked by a quarantine.

Screen Printer Setup Control

Eliminate defects due to the incorrect setup of solder paste and tooling

Features:

- Uniquely identify solder paste containers and tooling
- Validate solder paste, stencil, squeegee, tooling
- Compatible with all major brands & models

Benefits:

- Eliminate human error
- Reduce changeover time
- Complete traceability
- Avoid mixing Pb and Pb-Free

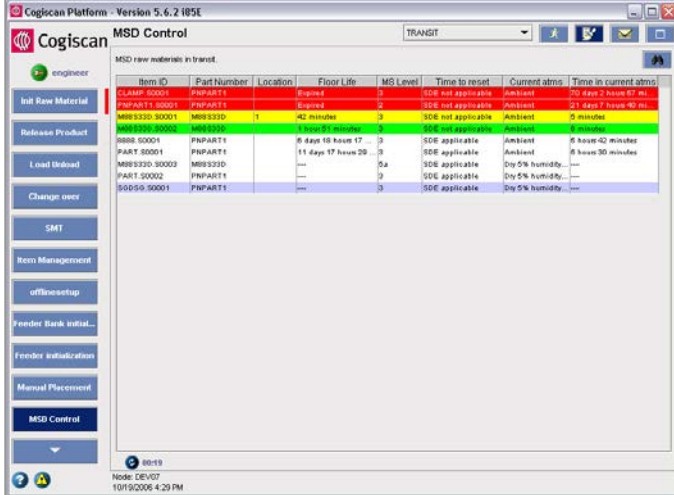


MSD Control

Automate the management of moisture-sensitive devices in compliance with JEDEC standards

Features:

- Track reels/trays containing MSDs throughout the entire lifecycle
- Provide real-time status and physical location on the assembly line, dry cabinet, re-sealed dry bag and oven
- Calculate remaining floor life in real-time
- Provide warnings and alarms before expiration
- Interlock the line when MSDs are expired with PFC
- Tracks MSDs on double-sided PCBAs



The screenshot shows the 'MSD Control' window in the Cogiscan Platform. The table displays the following data:

Item ID	Part Number	Location	Floor Life	MS Level	Time to reset	Current atmos	Time in current atm
CLAMP 30002	PNPART1	Expired	0	3	SDE not applicable	ambient	29 days 2 hours 47 m
PNPART1 30001	PNPART1	Expired	0	3	SDE not applicable	Ambient	21 days 7 hours 49 m
MSB330 30001	MSB330	T	42 minutes	3	SDE not applicable	Ambient	0 minutes
MSB330 30003	MSB330	T	5 hours 21 minutes	3	SDE not applicable	Ambient	0 minutes
MSB 30001	PNPART1	...	8 days 18 hours 17 m	3	SDE applicable	Ambient	8 hours 42 minutes
PART 80001	PNPART1	...	11 days 17 hours 29 m	3	SDE applicable	Ambient	8 hours 30 minutes
MSB330 30003	MSB330	...	...	3a	SDE applicable	Dry 0% humidity	...
PART 50002	PNPART1	...	...	3	SDE applicable	Dry 0% humidity	...
50050 30001	PNPART1	...	...	3	SDE applicable	Dry 0% humidity	...



**The Industry Standard
for MSD Control**



Time Sensitive Material Control Module

Automate the management and use of consumables with special requirements

- Improved management of materials with unique handling requirements including:
 - Solder paste
 - Conformal coating
 - Adhesives
 - Other chemicals
- Will stop the machine when any material rules are violated
- Manages floor life and material expiration, as well as cold storage and thawing requirements

The screenshot displays the 'Manage Consumable Floor Life' window. At the top, a table lists consumable items with columns for Item ID, Item type, Container, Location in container, Sealed, Status, Remaining Floor Life, Cumulative time in Cold Storage, and Thawing (can be used at). Below the table, a sidebar on the left contains navigation buttons: Kitting Control, Factory Monitor, Item Management, Release Product, Screen Printer, ScreenPrint Inspect..., Pick&Place (SMT), Autoinspection (ADI), Kit Reservation Start..., Reflow, Kitting Control, Packing, Rework Task, and Raw Material Invt.

The main content area shows details for Item ID: 1.5300001, Part Number: PASTE1, Item type: PASTE, Seal status: Opened, and Status: Ready to use. It includes sections for Time Information (Remaining floor life: 3 hours 48 minute, Expiration timestamp: 11/27/2017 7:11 P), Thawing information, and Rule information (Floor life of new package: 1 day, Floor life of opened package: 1 day 2 hours, Storage temperature: 12°C, etc.).

A 'Reporting' dialog box is open, listing various reports such as Component WIP Report, Batch WIP Report, Product WIP Report, Fonder Marriage Count Report, Raw Materials Usage History Report, Raw Material Attrition Report, Product History Report, Batch Report, Tool History Report, and Production and Consumption Report. The 'Report filter type' section includes radio buttons for 'Consumables that are ready to use' (selected), 'Consumables that are thawing', 'Consumables that are about to expire in' (with input fields for Days and Hours), 'Expired consumables', and 'Consumables in storage for more than' (with input fields for Days and Hours). There is also an 'All consumables' option and a 'Search' button.

SMD Tower Integration

- Seamless integration with Kitting Control, Offline Job Setup, Line setup and Low level Alarms software
 - Work order preparation before changeover
 - Automatic release of reels from tower with a click of a button in the Cogiscan Operator Interface
- Synchronisation of
 - Reel initialization
 - Quantity updates based on component consumption on machine
 - Reels put back to stock



LED BIN Control

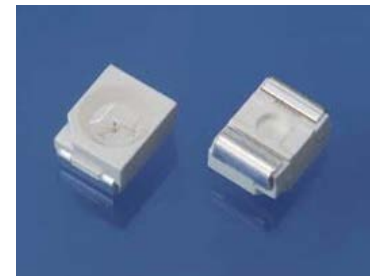
Ensure consistent LED brightness across PCBAs by controlling BIN compatibility

Features:

- Additional validation process during machine/feeder setup
- Prevent mixing incompatible BINs during production and/or activate matching resistors in placement program

Benefits:

- Eliminate the risk of mixing LED BINs
- Ensure quality/uniformity of LED product
- Eliminate cumbersome manual control procedures



LCR Control Module

Verify the electrical characteristics of components


- Ensures component's electrical characteristics are accurate and match their label
- Catches problem components before they are loaded and used for assembly
- Helps to eliminate the risk of using the wrong passive components during production



Please take 1 sample from component container and make measurement on LCR Meter

Measured value: _____
Nominal: _____ +/- _____ %

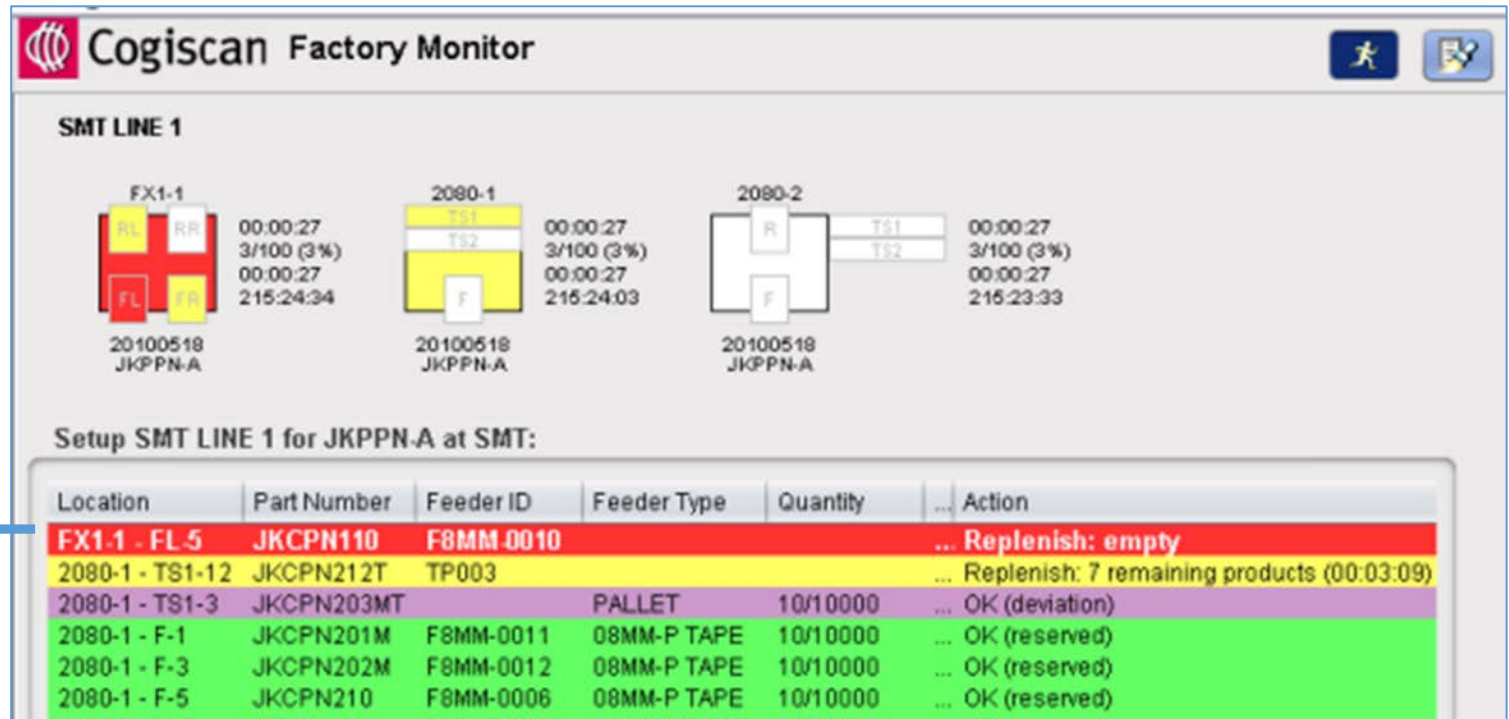
PASSED or **REJECTED**



Tool	Item ID	Location	Part Number	Component	Test Result	Test Value
TOOL 1	COMP7	100-2-TRK1	COMPONENT_PN	Body Marking	FAIL	BGA
TOOL 2	COMP8	200-3-TRK2	COMPONENT_PN_INDUCT	Inductor	FAIL	80 H

Low-Level Alarms

- Avoid line stoppages due to empty feeders
- Improve asset utilization
- Automatically trigger material pull from Automated Storage Tower



Cogiscan Factory Monitor

SMT LINE 1

FX1-1 (20100518 JKPPN-A) | 2080-1 (20100518 JKPPN-A) | 2080-2 (20100518 JKPPN-A)

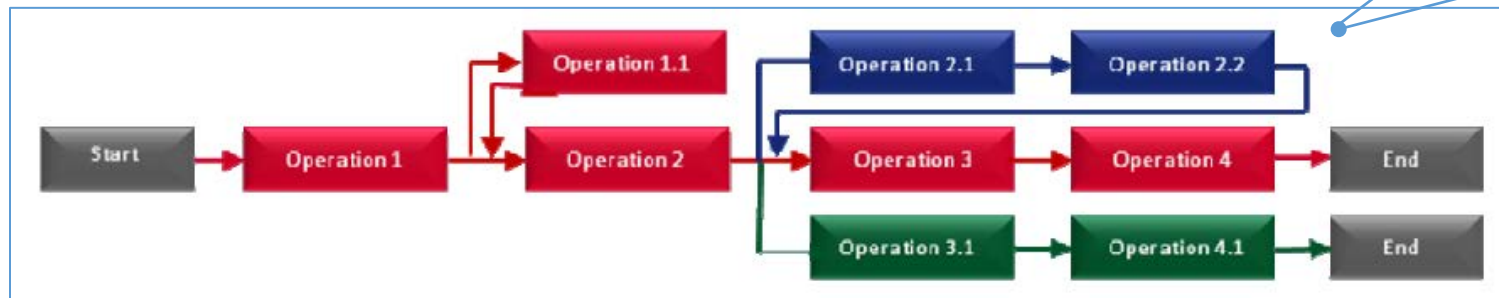
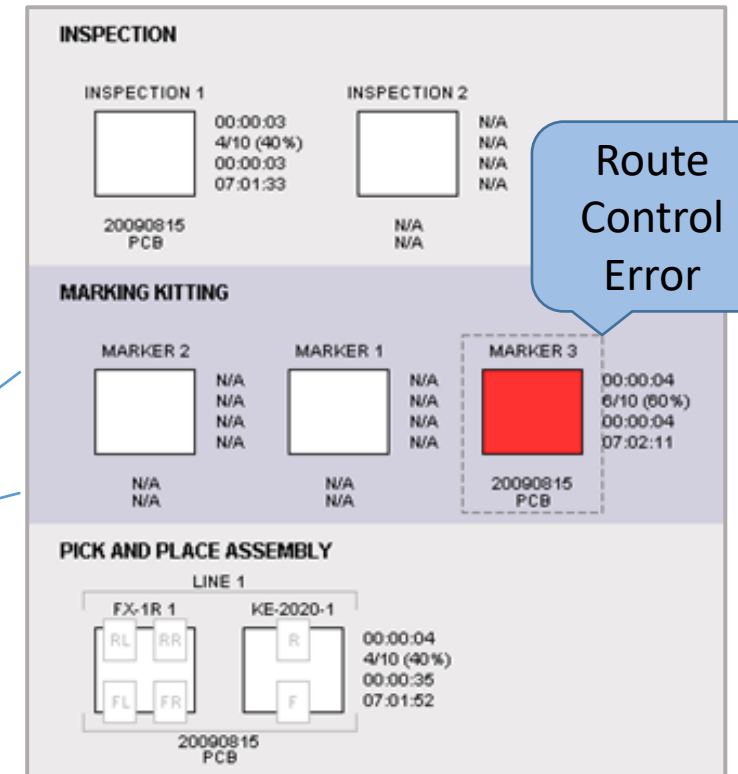
Setup SMT LINE 1 for JKPPN-A at SMT:

Location	Part Number	Feeder ID	Feeder Type	Quantity	Action
FX1-1 - FL-5	JKCPN110	F8MM.0010			... Replenish: empty
2080-1 - TS1-12	JKCPN212T	TP003			... Replenish: 7 remaining products (00:03:09)
2080-1 - TS1-3	JKCPN203MT		PALLET	10/10000	... OK (deviation)
2080-1 - F-1	JKCPN201M	F8MM-0011	08MM-P TAPE	10/10000	... OK (reserved)
2080-1 - F-3	JKCPN202M	F8MM-0012	08MM-P TAPE	10/10000	... OK (reserved)
2080-1 - F-5	JKCPN210	F8MM-0006	08MM-P TAPE	10/10000	... OK (reserved)

Route Control

Eliminate errors by ensuring products follow the correct production route

- Define valid production routing for each product
- Ensure that all products follow the correct sequence of production operations based on the routing
- Issue alarms when a product is at the wrong operation
- Prevent the product from entering the wrong station using the Product Flow Controller



WIP Tracking

Gain visibility into which products and materials are currently in WIP

- Track in real time which products are currently active or waiting on the production line
- Track which components are currently being used in WIP
- Display WIP quantities for a given batch (work order)
- Export data to Excel or CSV

Cogiscan Product WIP Report
Track Trace Control Generated on 03/07/2018 11:49:50 AM

Operation: Reflow
 Tool ID: REF01

ACTIVE

Serial Number	Batch ID	Part Number
12345678000783	12345678	PROD1

Number of records: 1

Cogiscan Batch WIP Report
Track Trace Control Generated on 10/27/2017 11:32:06 AM

Operation: Scr
 Tool ID:

WAITING

Batch ID (Work Order #): BPRODUCT1
 Batch Qty: 5
 Released Batch Qty: 5 100%
 Active Qty: 0 0%
 Rejected Qty: 0 0%
 Completed Qty: 5 100%
 Total Process Yield: 100%
 Product PN: PRODUCT1
 Product Revision:
 Product Family: PCB

All active, excluding non-reworkables
 All scrapped and active non-reworkables
 Percentage takes into account rejects
 Completed, including rejected

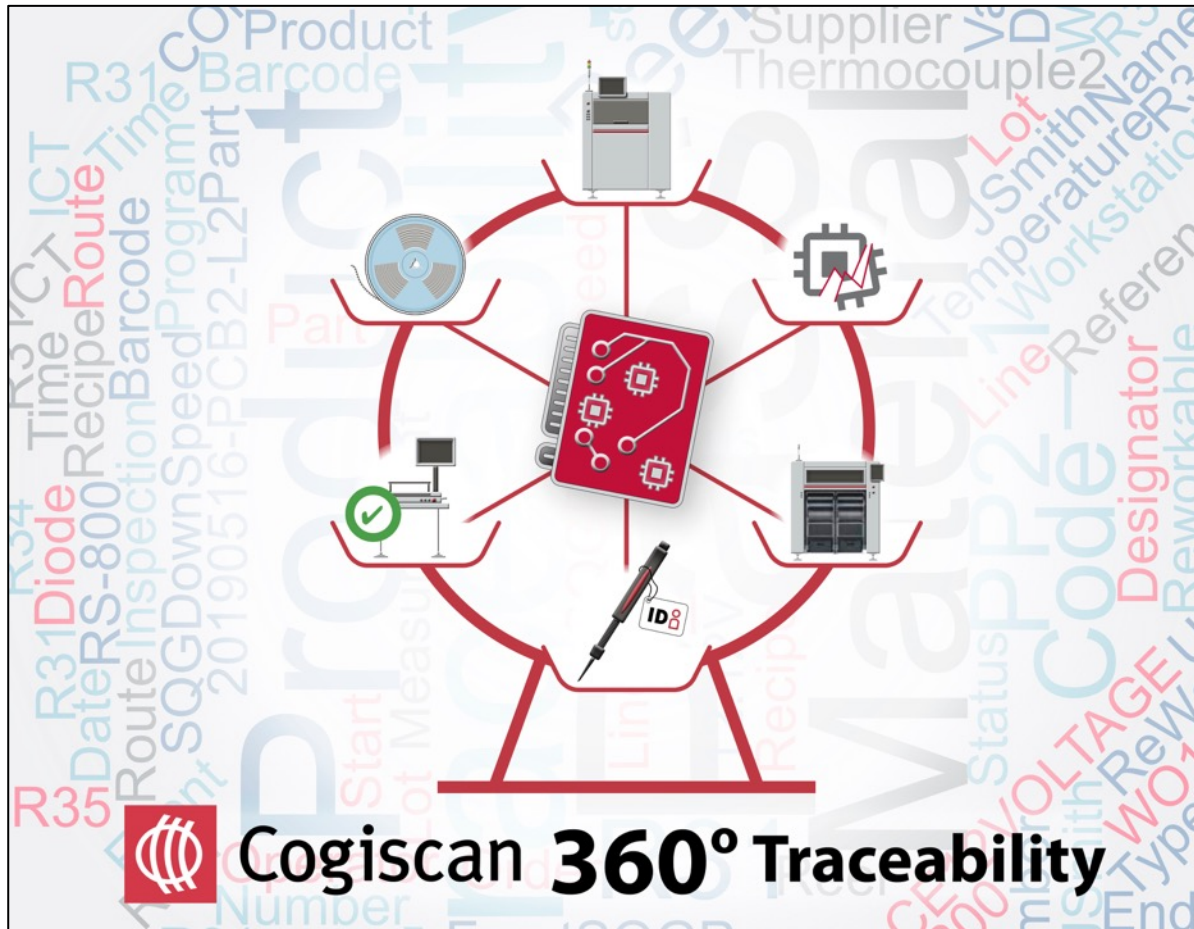
Operation	Tool	Waiting	In Process	Staged	Completed	Scrap	Reworkable	Non Reworkable	Reworked	Yield
material init (Material Initialize)		0	0	0	5	0	0	0	0	100%
SPI Inspection (SPI)		0	0	0	4	0	1	0	0	75%
SMT (R&P smt)		0	0	0	3	0	0	0	0	100%
Inspection AOI (AOI)		0	0	0	3	0	1	0	0	67%
route step manual assy (manual assy)		0	0	0	3	0	0	0	0	100%

Operation yield calculated as: (Completed - Reworkable - Non Reworkable) / Completed
 Rework yield calculated as: Reworked / Completed

Cogiscan Component WIP Report
Track Trace Control Generated on 07/30/2015 9:05:54 AM

Part Number	Supplier Part Number	Item ID	Feeder ID	Location	Kit ID	Initial Qty	Current Qty
1PROC		1PROC.01	FD-TRK1	PP-8080-01 (F-5-1)		5000	5000
1PROC		1PROC.02	FD-TRK1	PP-8080-01 (F-5-2)		5000	5000
1PROC		1PROC-	FD-08MMTAPE-A	PP-FP2-80-80-1-01 (F-1)		1000	1000
1PROC		201408121125.S000001					
1PROC		1PROC-	FD-08MMTAPE-B	PP-FP2-80-80-1-01 (F-3)		5000	5000
1PROC		201408121127.S000002					
1PROC		1PROC-	FD-08MMTAPE-C	PP-FP2-80-80-1-01 (F-7)		5000	5000
1PROC		201408121127.S000001					
1PROC		1PROC	FD-PROG-3	PP-FP4-40-40-03 (F-14)		2000	1500
1PROC		BATCHPROC1				3000	3000
1PROC		1PROC-			KITD28-1 (D28)	5000	3842
1PROC		201408071412.S000002					
1PROC		1PROC-			KITD18-1 (D18)	5000	4652
1PROC		201408071412.S000003					
						Total:	33994

TRACEABILITY



Offers **complete and accurate reporting** of the entire production process. Includes:

- **product, material, and process** traceability for **all manufactured units**

Both **fast and reliable**, our traceability reporting is a go-to resource tool for **electronics manufacturers worldwide**.

Traceability: Benefits

- **Guarantees compliance** with regulatory requirements
- **Enables immediate action** to identify the source and scope of a quality issue
- **Improves process compliance** in order to simplify client audits
- **Simplifies corrective action** reporting and recall management requirements
- **Improves customer satisfaction** through accurate and reliable traceability reporting

//
The most important benefit is that every time we want to create a traceability report for a customer, we save a lot of time in retrieving the information and we are really confident that the data is very accurate.

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Lin Lin TI, IT Manager Flash Electronics

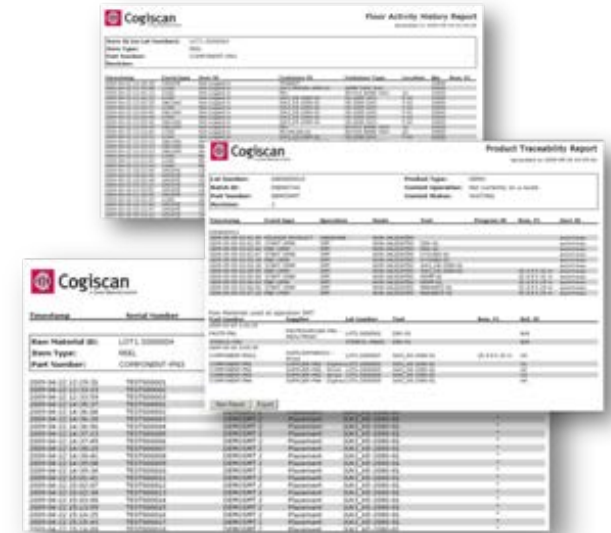


Product Traceability

Records all product-level information for manufactured units

Includes:

- Product & Work Order Information
- Each Operation's Start & End Date/Time
- Line / Machine / Workstation ID
- Operator Name/ID



1



2



3



4



Product Traceability: Reporting

Product
Serial Number

Cogiscan Track Trace Control		Product Traceability Report					
Lot Number: PCBA-1		Product Type: PCB					
Batch ID: BPCBA		Current Operation: Not in WIP					
Part Number: PCBA							
Timestamp	Event Type	Operation	Route	Tool	Program ID	Rem. FL	User ID
PCBA-1							
11/23/2016 9:30:33 AM	RELEASE PRODUCT	inspection receiving (rcv inspection)	RCV/MARK/P&P/INSP/OVEN/AOI				Not Logged in
11/23/2016 10:23:08 AM	START OPER	inspection receiving (rcv inspection)	RCV/MARK/P&P/INSP/OVEN/AOI	RCV INSP (SH)			JSmith
11/23/2016 10:23:16 AM	END OPER	inspection receiving (rcv inspection)	RCV/MARK/P&P/INSP/OVEN/AOI	RCV INSP (SH)			JSmith
11/23/2016 10:27:10 AM	START OPER	Marking (Marking)	RCV/MARK/P&P/INSP/OVEN/AOI	MARKING (SH)	pcbamarkprog		JSmith
11/23/2016 10:27:10 AM	END OPER	Marking (Marking)	RCV/MARK/P&P/INSP/OVEN/AOI	MARKING (SH)			JSmith
11/23/2016 10:27:26 AM	START OPER	Route step SMT (smt placement)	RCV/MARK/P&P/INSP/OVEN/AOI	P&P (SH)			JSmith
11/23/2016 10:27:30 AM	END OPER	Route step SMT (smt placement)	RCV/MARK/P&P/INSP/OVEN/AOI				JSmith
11/23/2016 10:28:02 AM	START OPER	Inspection (post smt insp)	RCV/MARK/P&P/INSP/OVEN/AOI	INSP TABLE (SH)			JSmith
11/23/2016 10:28:37 AM	END OPER	Inspection (post smt insp)	RCV/MARK/P&P/INSP/OVEN/AOI	INSP TABLE (SH)			JDoe

Time Stamp

Start / End

Route Step

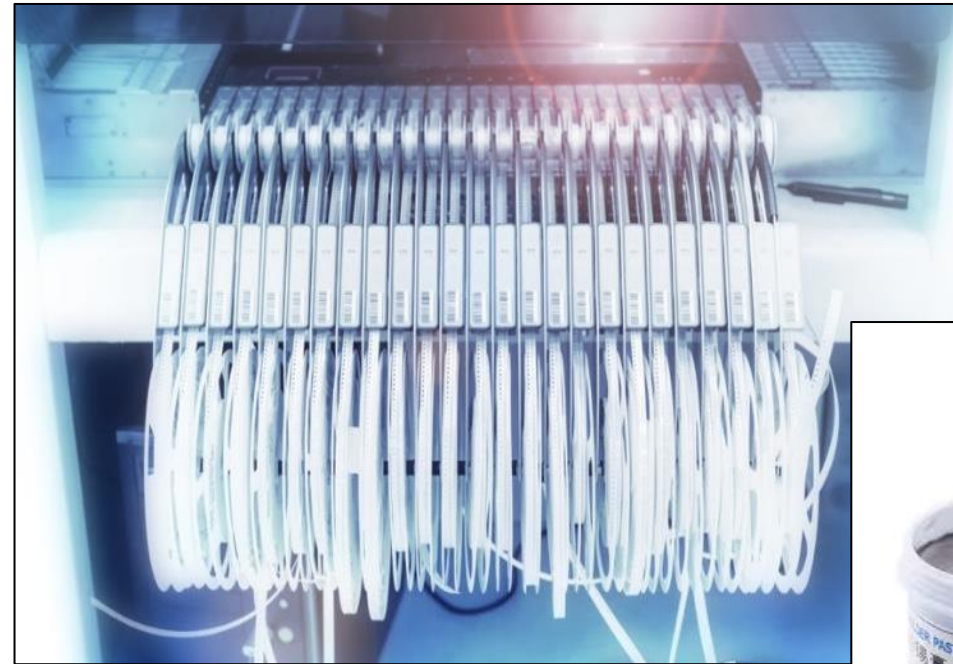
Operator ID

Machine Name

Material Traceability

Trace information related to all raw materials used during production

- Includes components, consumables, and tooling
- Available for each product's serial number:
 - Unique ID
 - Part Number
 - Supplier
 - Lot & Date Codes
 - MSD Information
- Trace from material info (e.g., lot code, reel ID) to find units produced





Material Traceability: Reporting

View raw material details for each component placed on the PCBA:

- Part number
- Supplier
- Lot number
- Machine/Tool
- Reference Designator



Product Traceability

Generated on

Lot Number: 20190531-PCB02-000000 **Product Type:** PCB
Batch ID: 20190531-PCB02 **Current Operation:** Not in WIP
Part Number: PCB02

Raw Materials used at operation SMT

Part Number	Supplier	Lot Number	Tool	Rem. FL	LCR Test	Part Ref. ID
<i>05/31/2019 1:01:26 PM</i>						
COMP1	-	COMP1.A	PP2_1			R11, R12, R13, R14, R15
COMP2	-	COMP2.B	PP2_1			R21, R22, R23, R24, R25
COMP3	-	COMP3.B	PP2_1			R31, R32, R33, R34, R35
COMP4	-	COMP4.B	PP2_1			R41, R42, R43, R44, R45
COMP5	-	COMP5.B	PP2_1			R51, R52, R53, R54, R55
COMP6	-	COMP6.B	PP2_1			R61, R62, R63, R64, R65
COMP7	-	COMP7.B	PP2_1			R71, R72, R73, R74, R75
COMP8	-	COMP8.B	PP2_1			R81, R82, R83, R84, R85
<i>05/31/2019 1:02:11 PM</i>						
COMP1	-	COMP1.B	PP2_2			R11, R12, R13, R14, R15
COMP2	-	COMP2.A	PP2_2			R21, R22, R23, R24, R25
COMP3	-	COMP3.A	PP2_2			R31, R32, R33, R34, R35
COMP4	-	COMP4.A	PP2_2			R41, R42, R43, R44, R45
COMP5	-	COMP5.A	PP2_2			R51, R52, R53, R54, R55



Material Traceability: Reporting



Product Traceability Report

Generated on 08/05/2019 5:59:35 PM

Lot Number: 20190531-PCB02-000000
Batch ID: 20190531-PCB02
Part Number: PCB02

Product Type: PCB
Current Operation: Not in WIP

Raw Materials used at operation SMT

Part Number	Supplier	Lot Number	Tool
05/31/2019 1:01:26 PM			
COMP1	-	COMP1.A	PP2_1
COMP2	-	COMP2.B	PP2_1
COMP3	-	COMP3.B	PP2_1
COMP4	-	COMP4.B	PP2_1
COMP5	-	COMP5.B	PP2_1
COMP6	-	COMP6.B	PP2_1
COMP7	-	COMP7.B	PP2_1
COMP8	-	COMP8.B	PP2_1
05/31/2019 1:02:11 PM			
COMP1	-	COMP1.B	PP2_2
COMP2	-	COMP2.A	PP2_2
COMP3	-	COMP3.A	PP2_2
COMP4	-	COMP4.A	PP2_2
COMP5	-	COMP5.A	PP2_2



Raw Materials Usage History Report

Generated on 08/05/2019 6:36:38 PM

Timestamp	Serial Number	Batch ID	Part Number	Operation	Tool ID	Rem. FL
Raw Material ID: COMP6.B						
Item type: REEL						
Part Number: COMP6						
Supplier: -						

2019-05-16 13:48:56	20190516-PCB2-L2-000001	20190516-PCB2-L2	PCB02	SMT	PP2_1	
2019-05-16 13:49:17	20190516-PCB2-L2-000002	20190516-PCB2-L2	PCB02	SMT	PP2_1	
2019-05-16 13:49:42	20190516-PCB2-L2-000003	20190516-PCB2-L2	PCB02	SMT	PP2_1	
2019-05-16 13:50:23	20190516-PCB2-L2-000004	20190516-PCB2-L2	PCB02	SMT	PP2_1	
2019-05-16 13:51:03	20190516-PCB2-L2-000005	20190516-PCB2-L2	PCB02	SMT	PP2_1	
2019-05-16 13:51:44	20190516-PCB2-L2-000006	20190516-PCB2-L2	PCB02	SMT	PP2_1	
2019-05-16 13:52:25	20190516-PCB2-L2-000007	20190516-PCB2-L2	PCB02	SMT	PP2_1	
2019-05-16 13:53:06	20190516-PCB2-L2-000008	20190516-PCB2-L2	PCB02	SMT	PP2_1	
2019-05-16 13:53:47	20190516-PCB2-L2-000009	20190516-PCB2-L2	PCB02	SMT	PP2_1	
2019-05-16 13:54:27	20190516-PCB2-L2-000010	20190516-PCB2-L2	PCB02	SMT	PP2_1	
				SMT	PP2_1	
				SMT	PP2_1	
				SMT	PP2_1	
				SMT	PP2_1	
				SMT	PP2_1	
				SMT	PP2_1	
				SMT	PP2_1	

In order to find all products produced with a specific component, users can double-click on "Lot Number" to access the Raw Materials Usage History

Report.



Material Traceability: Reporting

SEARCH FOR MATERIALS

Lot number(s):

OR

Upload lot numbers from file: (one lot number per line) No file chosen

Batch ID:

Part Number:

Supplier Part Number:

Supplier Name:

Include reference id list:

Exact Match:

Item Type Class:

Item type:

Date :
 From: (mm/dd/yyyy)
 To: (mm/dd/yyyy)
 Show only events in this date range

Output to:

Show in report viewer:

SELECT MATERIALS

Reporting

- Component WIP Report
- Batch WIP Report
- Product WIP Report
- Feeder Marriage Count Report
- Raw Materials Usage History Report
- Raw Material Attrition Report
- Product History Report
- Batch Report
- Tool History Report
- Production and Consumption Report

Search Results

Item ID	Part Number	Supplier	Item Type
<input type="checkbox"/> COMP1.S000001	COMP1	-	REEL
<input type="checkbox"/> COMP3.S000001	COMP3	-	REEL
<input type="checkbox"/> COMP4.S000001	COMP4	-	REEL
<input type="checkbox"/> COMP2.S000001	COMP2	-	REEL
<input type="checkbox"/> COMP1.A	COMP1	-	REEL
<input type="checkbox"/> COMP1.B	COMP1	-	REEL
<input checked="" type="checkbox"/> COMP2.A	COMP2	-	REEL
<input type="checkbox"/> COMP2.B	COMP2	-	REEL
<input type="checkbox"/> COMP3.A	COMP3	-	REEL
<input type="checkbox"/> COMP3.B	COMP3	-	REEL

FIND UNITS BUILT WITH THOSE MATERIALS

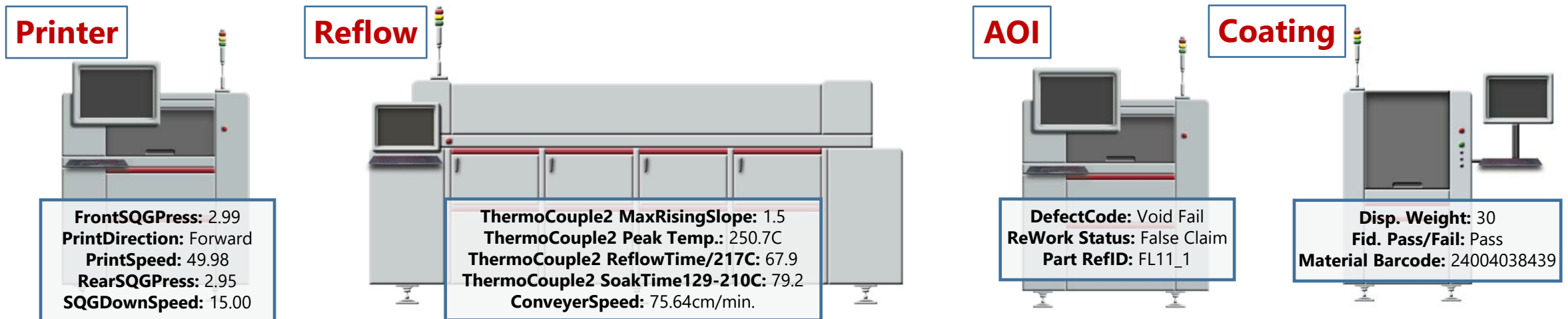
Timestamp	Serial Number	Batch ID	Part Number	Operation	Tool ID	Rem. FL
Raw Material ID: COMP2.A						
Item type: REEL						
Part Number: COMP2 Supplier: -						
2019-05-16 13:49:42	20190516-PCB2-L2-000001	20190516-PCB2-L2	PCB02	SMT	PP2_2	
2019-05-16 13:50:22	20190516-PCB2-L2-000002	20190516-PCB2-L2	PCB02	SMT	PP2_2	
2019-05-16 13:51:03	20190516-PCB2-L2-000003	20190516-PCB2-L2	PCB02	SMT	PP2_2	
2019-05-16 13:51:44	20190516-PCB2-L2-000004	20190516-PCB2-L2	PCB02	SMT	PP2_2	
2019-05-16 13:52:24	20190516-PCB2-L2-000005	20190516-PCB2-L2	PCB02	SMT	PP2_2	

Process Traceability

Trace all process-related settings, parameters and measurements

Includes:

- Program / Recipe Name
- Temperature Settings / Actual Temperatures
- Test & Inspection Pass / Fail
 - With Defect Codes
- Measured Values for Electrical Test





Process Traceability: Reporting

Timestamp	Event Type	Operation	Route	Tool	Program ID	Rem. FL	User ID
TESTSN001							
12/11/2018 10:35:37 PM	RELEASE PRODUCT	UNKNOWN	NON VALIDATED		PRODPN1		OPERATOR1
12/11/2018 10:35:51 PM	START OPER	REFLOW	NON VALIDATED	RS-800			OPERATOR1
12/11/2018 10:36:16 PM	PTDATA	REFLOW	NON VALIDATED	RS-800			CAMX EVENT PROCESSOR
12/11/2018 10:36:16 PM	END OPER	REFLOW	NON VALIDATED	RS-800			CAMX EVENT PROCESSOR
12/11/2018 10:37:53 PM	START OPER	ICT	NON VALIDATED	LINE2 ICT			CAMX EVENT PROCESSOR
12/11/2018 10:37:53 PM	END OPER	ICT	NON VALIDATED	LINE2 ICT			CAMX EVENT PROCESSOR
12/11/2018 10:38:20 PM	START OPER	FCT	NON VALIDATED	FCT2			OPERATOR1
12/11/2018 10:38:24 PM	END OPER	FCT	NON VALIDATED	FCT2			OPERATOR1

Defect Code	Rework Status	Operation	Part Ref. ID	Image ID	Comment	Source Defect
Event Timestamp: 12/11/2018 10:37:53 PM, User ID: CAMX EVENT PROCESSOR						
DIODE	Reworkable	ICT	Q1A-BC			
DIODE	Reworkable	ICT	U2-3-1			

Tool	Name	Value	Minimum	Maximum	Set Point	Input Type	User ID
12/11/2018 9:51:54 PM							
FCT2	TRACE12 VOLTAGE	12.12 V				Manual	Galen
	TRACE14 VOLTAGE	4.89 V				Manual	Galen
	TRACE31 VOLTAGE	3.29 V				Manual	Galen
12/11/2018 10:36:16 PM							
RS-800	CoolingRunning	y				CAMX	
	CurrentValueConveyorSpeed	100				CAMX	
	CurrentValueCoolZone1	0				CAMX	
	CurrentValueCoolZone2	0				CAMX	
	CurrentValueFAN1	49				CAMX	

Program / Recipe Name

Defects logged against PCBA during inspection/test

Process Parameters / Measured Values for each machine or step

User ID recorded for each station where logged in

Traceability: Genealogy

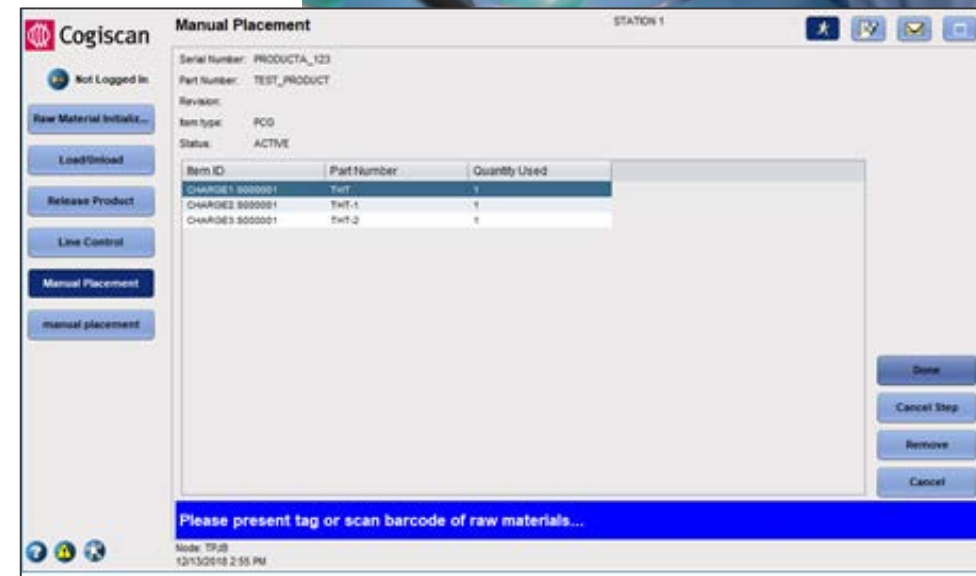
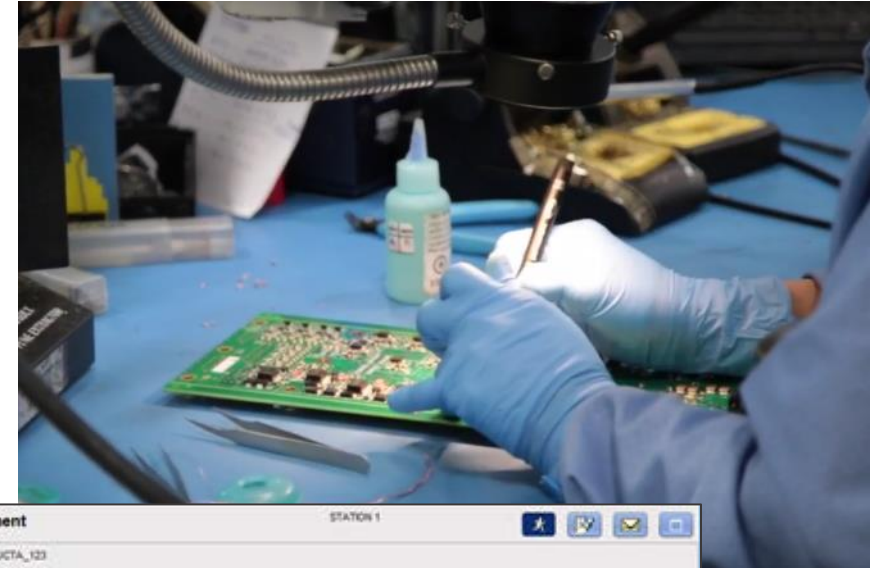
Accurately link all sub-assemblies to the final box build assembly

- Captures & records the identity of each individual PCBA as well as serialized components
- Supports multi-level BoM's in order to link all BoM level items to the final product's serial number
 - Trace up from the sub-assembly level
 - OR... Trace down from the final assembly level
- Validates that the correct sub-assembly part numbers are used in box build / final assembly



Manual Placement

- Record hand-placed components to work order or PCB
- Import product BOM to identify parts to be manually placed at each operation
- Require setup validation of material containers and tools to log material info
- Provide setup instructions to the operator to eliminate human error
- Link with Route Control module to validate routing



Defect & Repair Management

- Record defect codes for each PCBA
- Define and enforce rework route, including re-entry operation
- Block defective units from proceeding to subsequent steps until all defects are repaired
- Manage rework / repair process
- Record replaced material in unit history for traceability
- Automatically collect data from AOI, SPI & test equipment

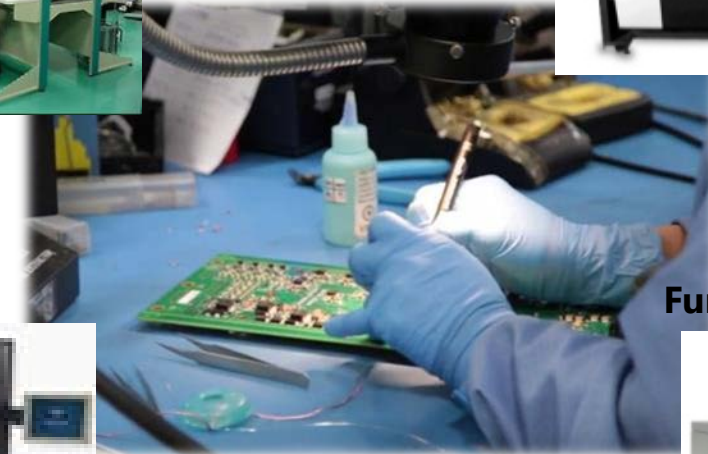
Manual Inspection



ICT



AOI

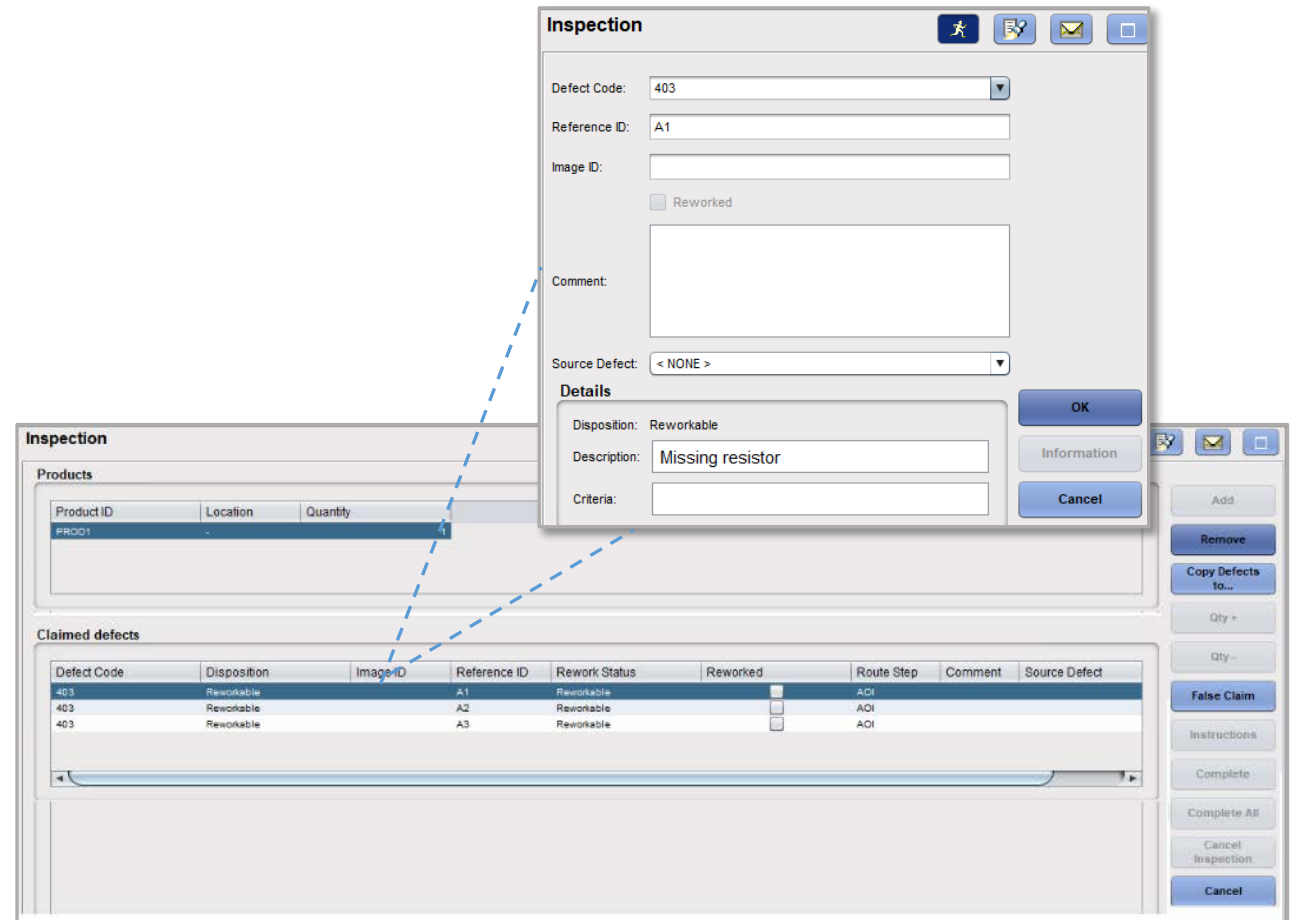


Functional Test



Manual Inspection

- Claim defects for each unit from a catalog of defect codes, and include details such as reference ID, image, comments, criteria, and source defect
- Copy defects between products for cases where multiple products contain the same defects
- Flag false claims from previous test / inspection steps
- Link to instructions for identifying specific defects



The screenshot displays the 'Manual Inspection' software interface. It features a main window with two tables: 'Products' and 'Claimed defects'. The 'Products' table has columns for Product ID, Location, and Quantity, with one row containing 'PROD1'. The 'Claimed defects' table has columns for Defect Code, Disposition, Image ID, Reference ID, Rework Status, Reworked, Route Step, Comment, and Source Defect. It contains three rows of defect data. A modal dialog box titled 'Inspection' is open, showing details for a specific defect. The dialog includes fields for Defect Code (403), Reference ID (A1), Image ID, Comment, Source Defect (< NONE >), Disposition (Reworkable), Description (Missing resistor), and Criteria. Buttons for OK, Information, and Cancel are present in the dialog. A dashed blue line indicates the link between the 'Reference ID' column in the 'Claimed defects' table and the 'Reference ID' field in the dialog.

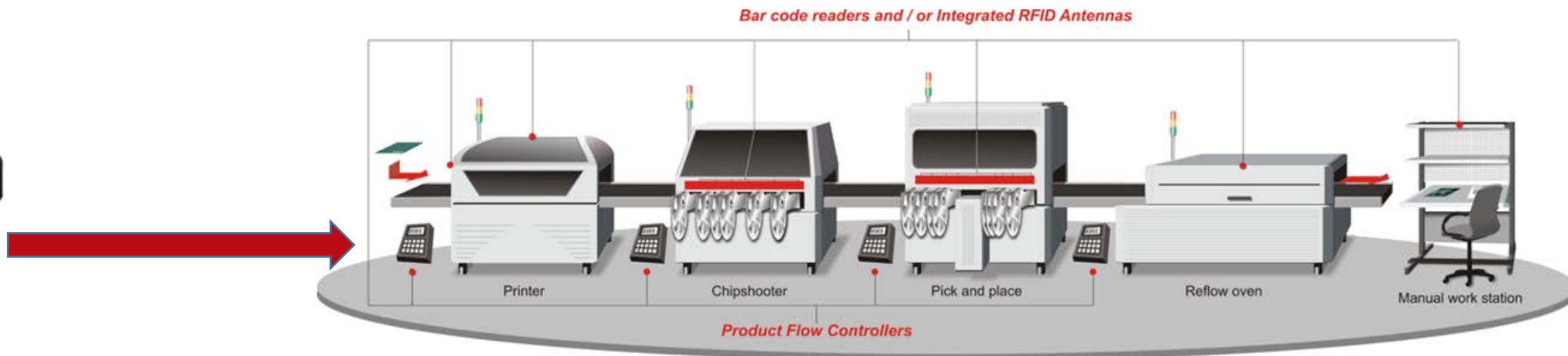
Product ID	Location	Quantity
PROD1		

Defect Code	Disposition	Image ID	Reference ID	Rework Status	Reworked	Route Step	Comment	Source Defect
403	Reworkable		A1	Reworkable	<input type="checkbox"/>	ACI		
403	Reworkable		A2	Reworkable	<input type="checkbox"/>	ACI		
403	Reworkable		A3	Reworkable	<input type="checkbox"/>	ACI		

Product Flow Controller (PFC+)



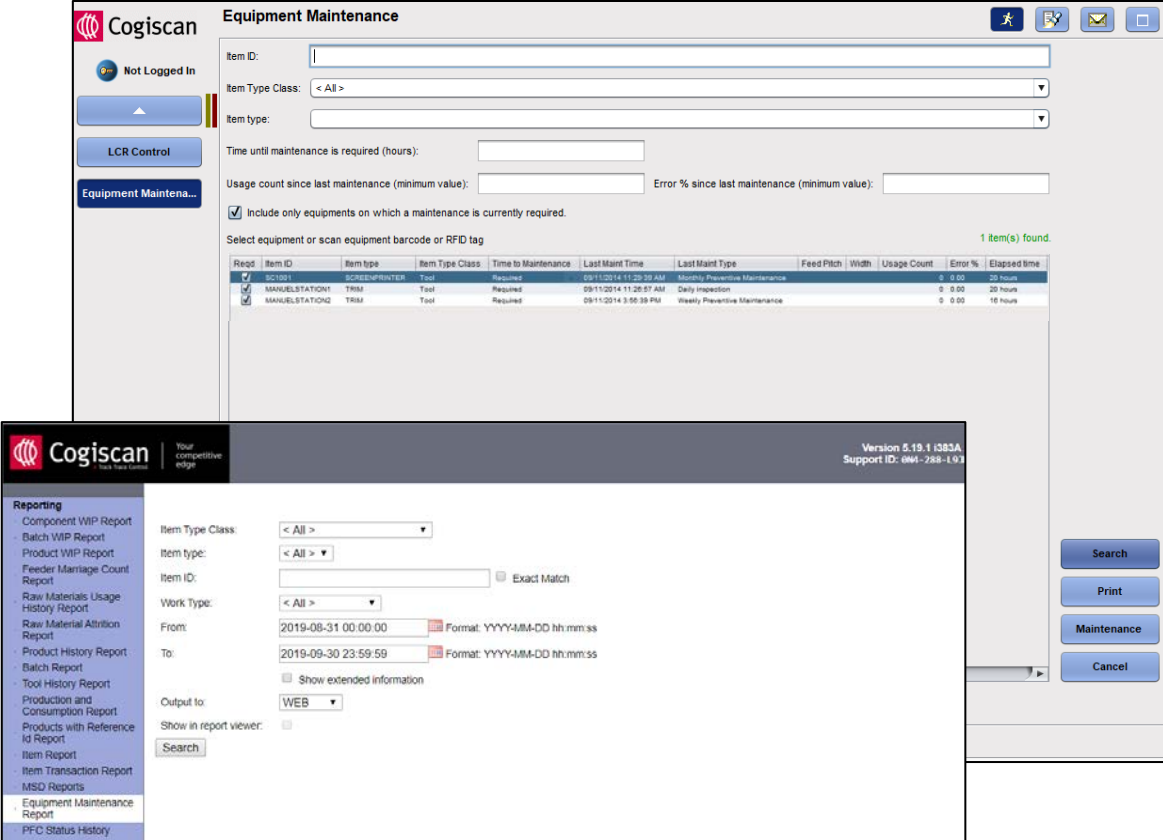
- Controls SMEMA to stop production (interlock) when there's a critical issue (e.g., invalid setup, route control error)
- Ensure 100% read rate of PCB bar codes
- Supports up to 2 Scanners per PFC to enable both top and bottom side scanning



Maintenance Control Module

Save money by preventing unforeseen machine downtime

- Effectively tracks and manages schedules for both preventative and corrective maintenance
- Allows users to set rules using:
 - Machine requirements
 - Operator input
 - Machine performance
 - Includes feeder pick counts and mispick ratio
- Warning alarms trigger maintenance
- Includes detailed maintenance history reporting



Equipment Maintenance

Item ID:

Item Type Class:

Item type:

Time until maintenance is required (hours):

Usage count since last maintenance (minimum value): Error % since last maintenance (minimum value):

Include only equipments on which a maintenance is currently required.

Select equipment or scan equipment barcode or RFID tag 1 item(s) found.

Regd	Item ID	Item type	Item Type Class	Time to Maintenance	Last Maint Time	Last Maint Type	Feed Pitch	Width	Usage Count	Error %	Elapsed time
<input checked="" type="checkbox"/>	MANUELSTATION2	TRIM	Tool	Required	09/11/2014 11:28:07 AM	Daily Inspection			0	0.00	22 hours
<input checked="" type="checkbox"/>	MANUELSTATION2	TRIM	Tool	Required	09/11/2014 3:55:39 PM	Weekly Preventive Maintenance			0	0.00	16 hours

Reporting

Item Type Class:

Item type:

Item ID: Exact Match

Work Type:

From: 2019-08-31 00:00:00 Format: YYYY-MM-DD hh:mm:ss

To: 2019-09-30 23:59:59 Format: YYYY-MM-DD hh:mm:ss

Show extended information

Output to:

Show in report viewer:

Version 5.19.1 (383A)
Support ID: 0M-788-193

Factory Intelligence

TAKE THE LEAD



**MEASURE.
REACT.
TAKE THE LEAD.**

Factory Intelligence (FI)

You cannot improve what you do not measure!

Factory Intelligence is the perfect web-based tool to get a holistic view of the entire manufacturing operation.

Available in two versions:

1. **Real-Time:** live production monitoring
2. **Analytics:** historical reporting and analysis



FI: User Benefits

- **Increase productivity** through better management of specific machines, individual lines, and overall factory performance.
- **React faster** to the most immediate areas of concern and send the appropriate resources to solve problems quickly.
- **Enhance continuous improvement** efforts with improved visibility into actual factory performance.
- **Improve manufacturing efficiency** with better understanding of factory performance.
- **Lower production costs** by avoiding unnecessary downtime.

//

Additionally, we have Cogiscan's Factory Intelligence tracking the performance of our 6 SMT Lines. Displayed on TV screens at the beginning of each line, Factory Intelligence offers a quick, visual illustration of critical key performance indicators to our production team.

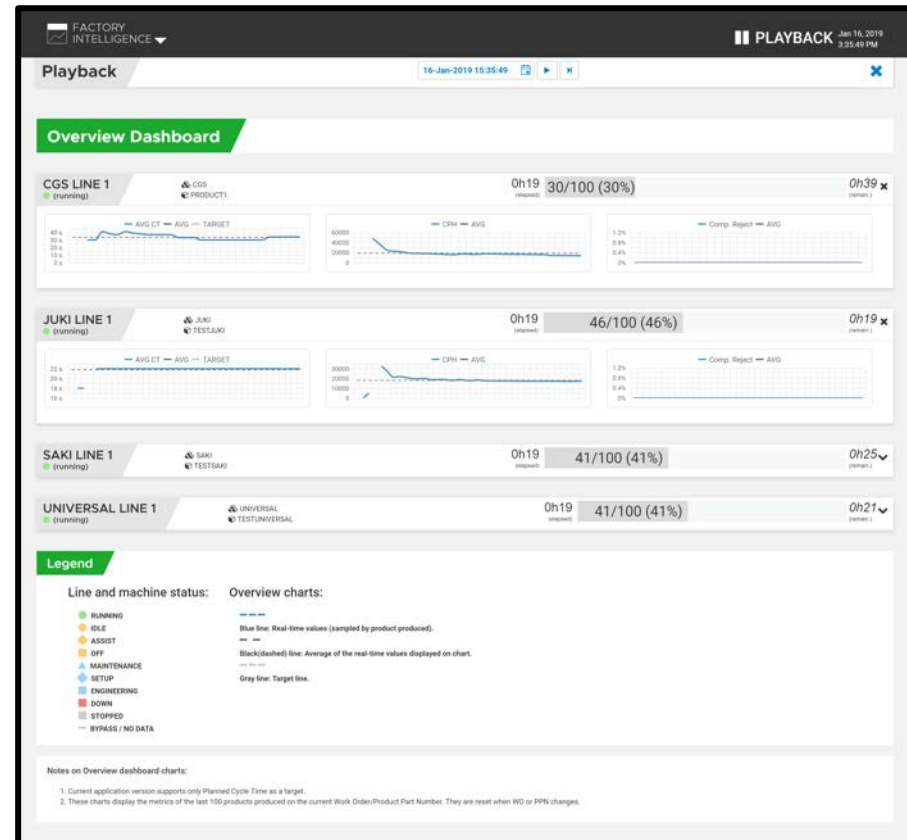
//

Jason Sciberras, VP of Manufacturing Saline Lectronics

FI: Real-Time

Live snapshot of production performance

- **User Friendly:** Mobile-friendly web interface that allows for quick identification of any areas of concern
- **Comprehensive:** Clear display of objective Key Performance Indicators (KPIs) per machine and per line
- **Flexible:** Customizable metrics with drill-down views at various levels – from factory, to line, to machine
- **Adaptable:** Playback feature for users to review past production events
- **Configurable:** Collected data can be integrated into a third-party tool using a WebSocket connection or Restful API.





FI Real-Time: Factory Overview

Real Time

Running product & work order

Line Status

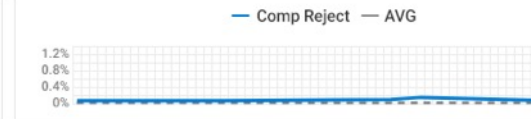
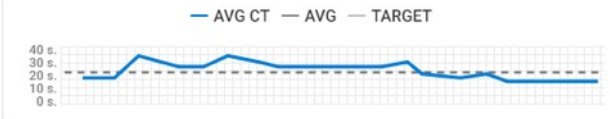
CGS LINE 1
running

BATCHA
IPC_RX6_RX6_TR8_TEST

1h11
elapsed

24/145 (44%)

1h07
remaining

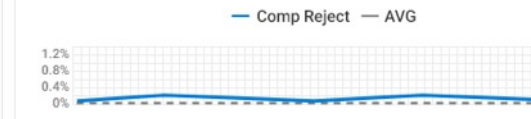
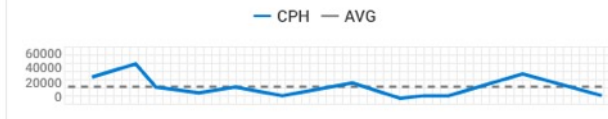
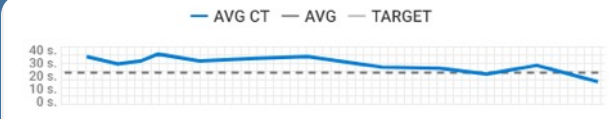


Completion rate, elapsed & remaining time

CGS LINE 2
running

Line cycle time, CPH, and Component Reject Ratio

2h08
remaining



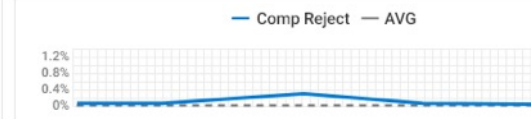
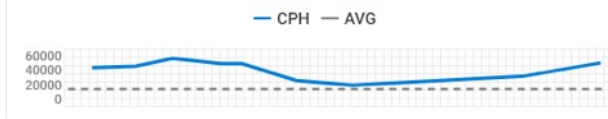
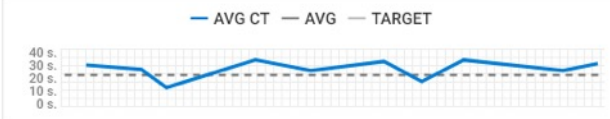
CGS LINE 3
running

BATCHC
IPC_RX5_RX1_TR2_TEST

1h17
elapsed

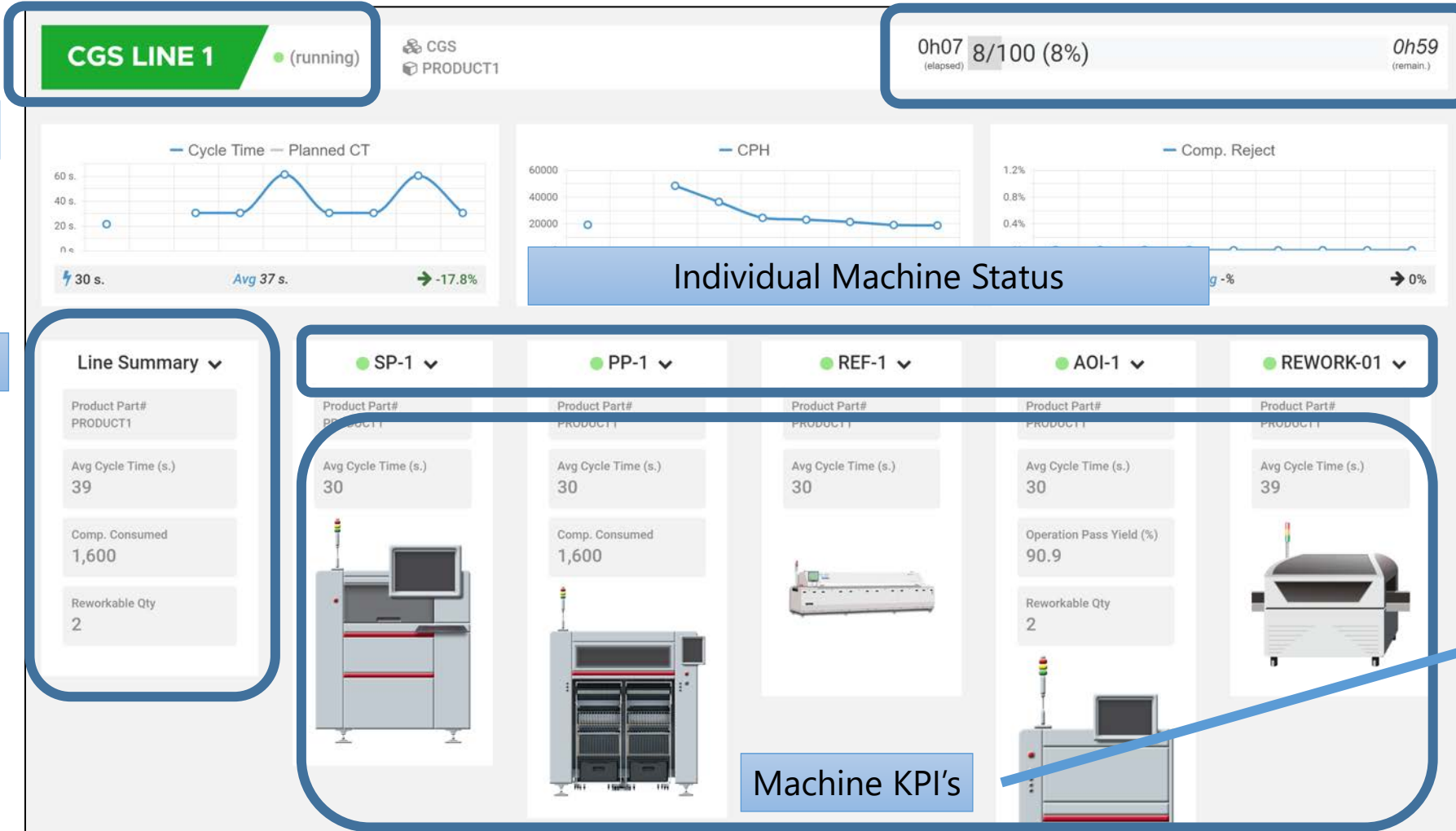
67/200 (33%)

2h34
remaining





FI Real-Time: Line Overview

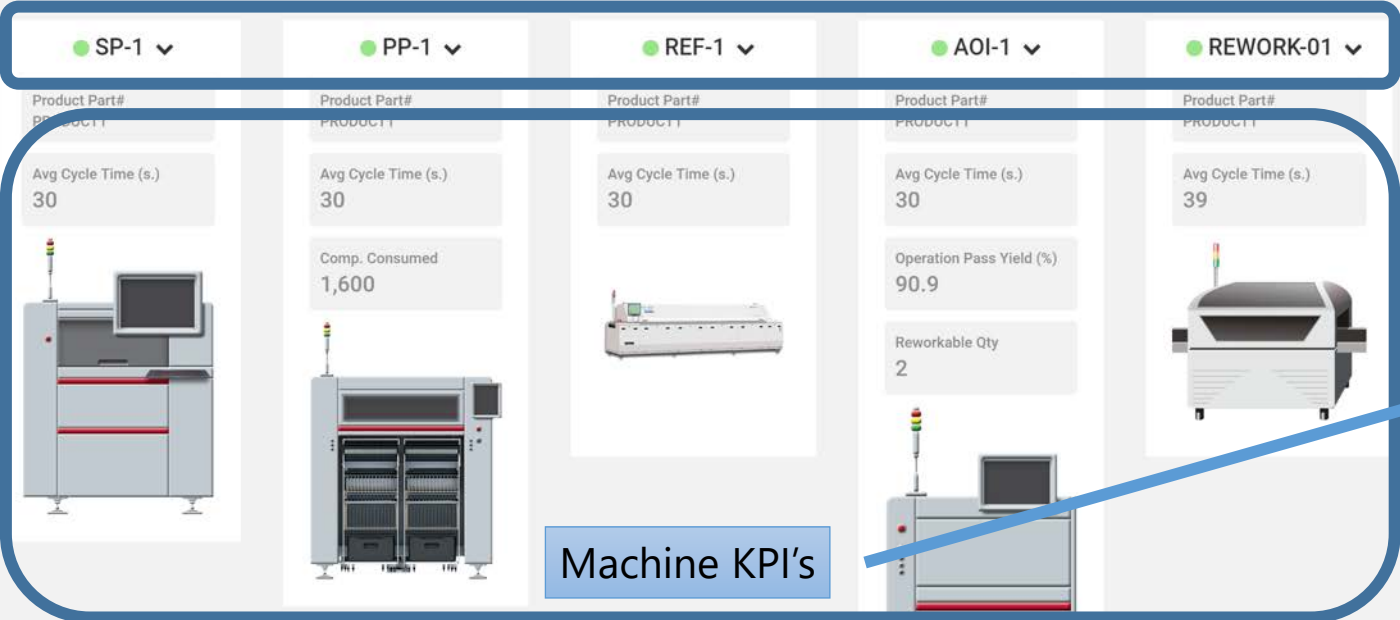


Line Status

Line KPI's

Completion rate, elapsed time, & remaining time


Individual Machine Status



Machine KPI's

Select metrics: ✕

- Avg Cycle Time
- Comp. Consumed
- Comp. Mispick
- Comp. Not Placed
- Last Board CT
- Non Reworkable Qty
- Operation Pass Yield
- Product Part#
- Reworkable Qty
- Reworked Qty



Factory Intelligence: Analytics

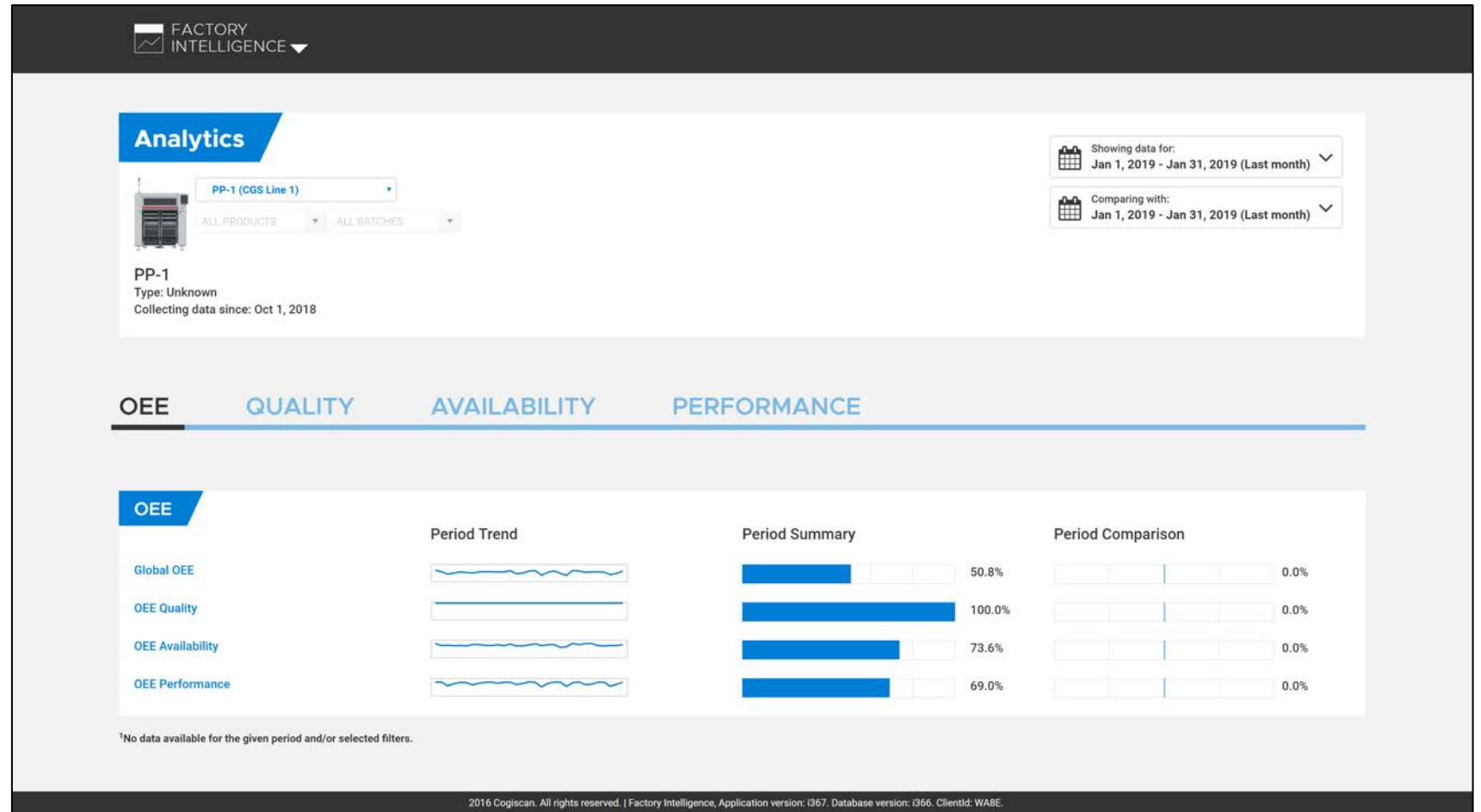
Displays analyzed metrics of machine utilization with customizable dashboards based on the Overall Equipment Effectiveness (OEE) method.

- **User Friendly:** Intuitive and mobile-friendly web interface that allows for quick assessment of quality, performance, and availability data per machine
- **Comprehensive:** 40+ predefined Key Performance Indicators (KPIs) to choose from
- **Flexible:** Interface to access data using external tools (Excel) to create customizable, offline reports
- **Open:** Quickly connect compatible machines with large interface library for most electronic assembly equipment types

FI Analytics: KPIs

Overall Equipment Effectiveness (OEE) method:

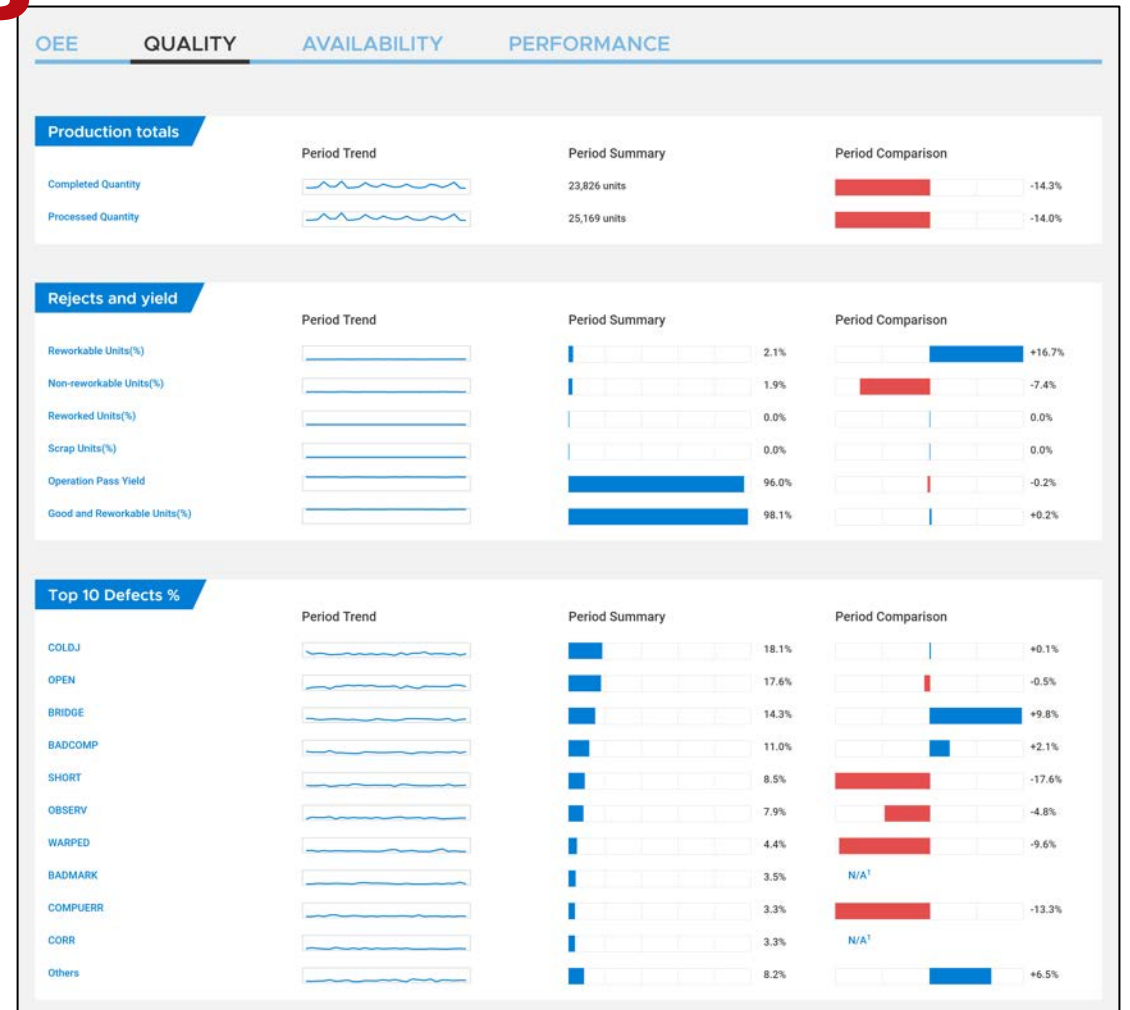
- Global OEE
- OEE Quality
- OEE Availability
- OEE Performance



FI Analytics: KPIs

OEE Quality

- Production Totals
 - Completed & Processed Quantities
- Rejects & Yield (%)
 - Reworkable & Non-Reworkable units
 - Reworked & Scrap Units
 - Operational Pass Yield
 - Good & Reworkable Units
- Top 10 Defects (%)
 - By defect type
 - Varies by machine type





FI Analytics: New KPIs

OEE Quality

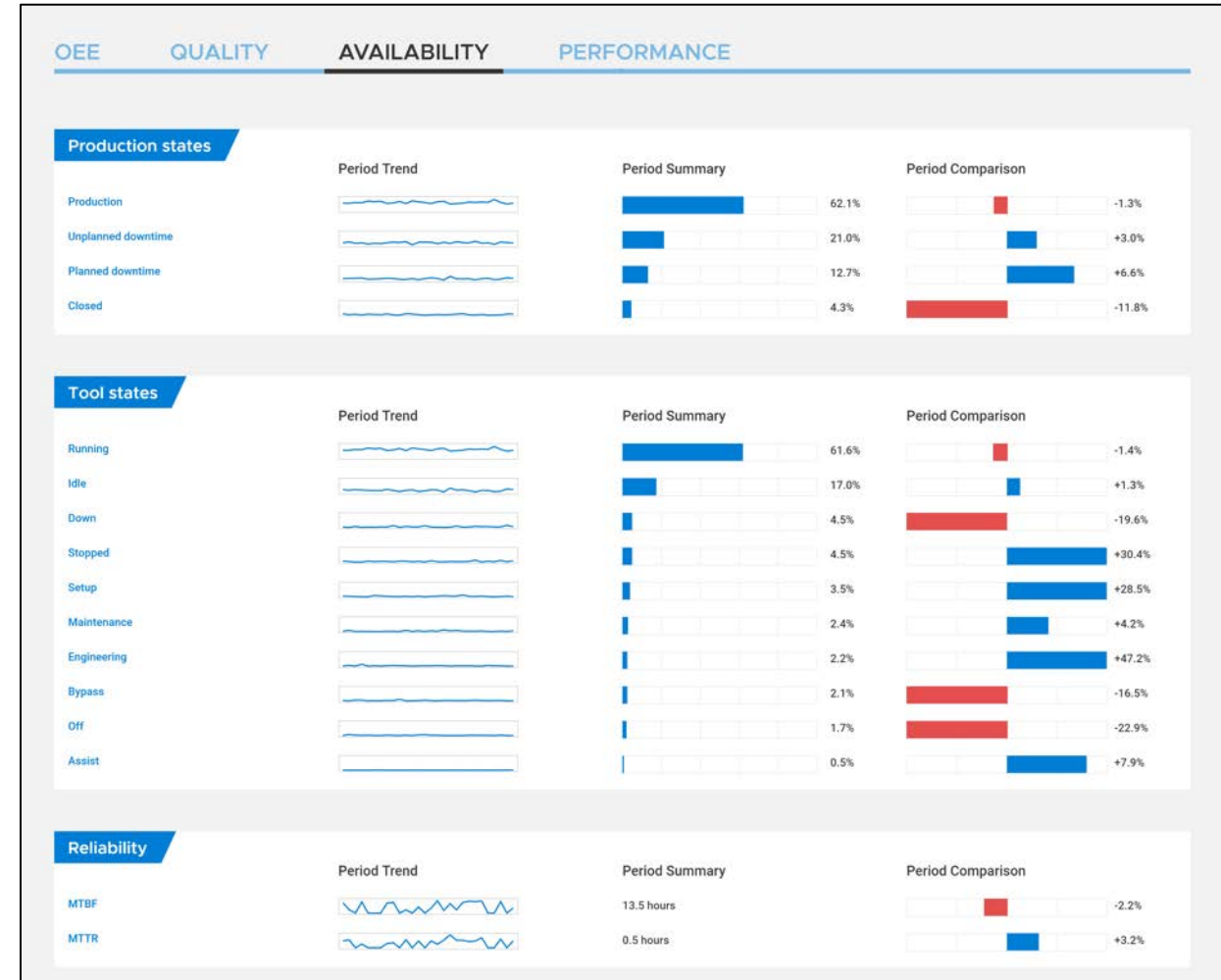
- New KPI's added September 2019 for Inspection Machines
- Rejects & Yield (%)
 - Defect on Detected Defect Ratio
 - False Claim on Detected Defect Ratio
 - Falsely Claimed Unit Ratio
 - Falsely Claimed on Defective Unit Ratio
 - Defective Site PPM
 - Falsely Claimed Site PPM
 - Defective Opportunity (DPMO)
 - Falsely Claimed Opportunity (DPMO)



FI Analytics: KPIs

OEE Availability

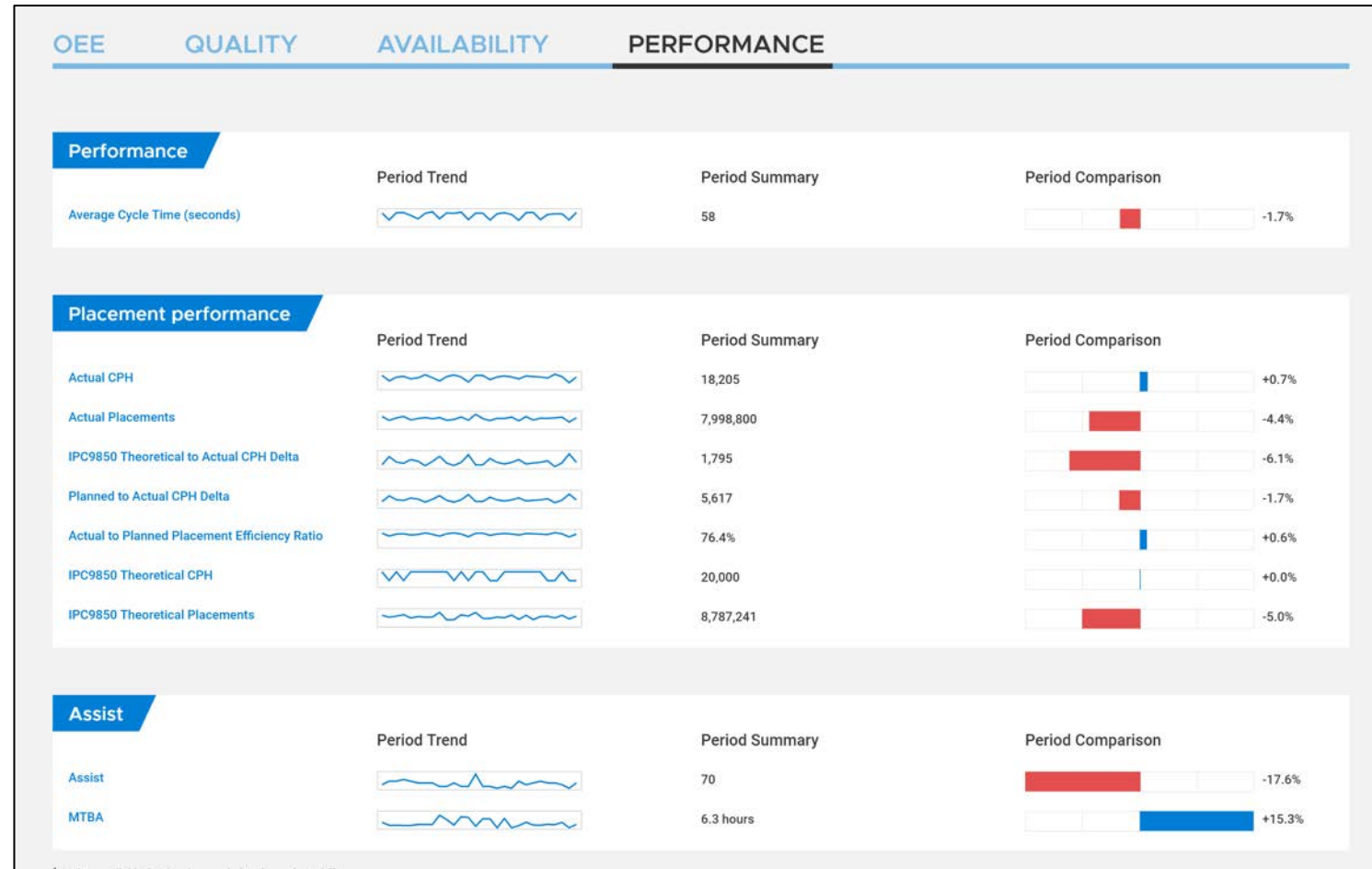
- Production States
 - Production
 - Unplanned & Planned Downtime
 - Closed
- Tool States
 - Running, Idle, Down, Stopped
 - Set-Up, Maintenance, Engineering
 - Bypass, Off, Assist
- Reliability
 - MTBF
 - MTTR



FI Analytics: KPIs

OEE Performance

- Performance
 - Average Cycle Time (seconds)
- Placement performance
 - Actual CPH, Actual Placements
 - IPC9850 Theoretical to Actual CPH
 - Planned to Actual CPH
 - Actual to Planned Placement Ratio
 - IPC9850 Theoretical CPH & Theoretical Placements
- Assist
 - MTBA

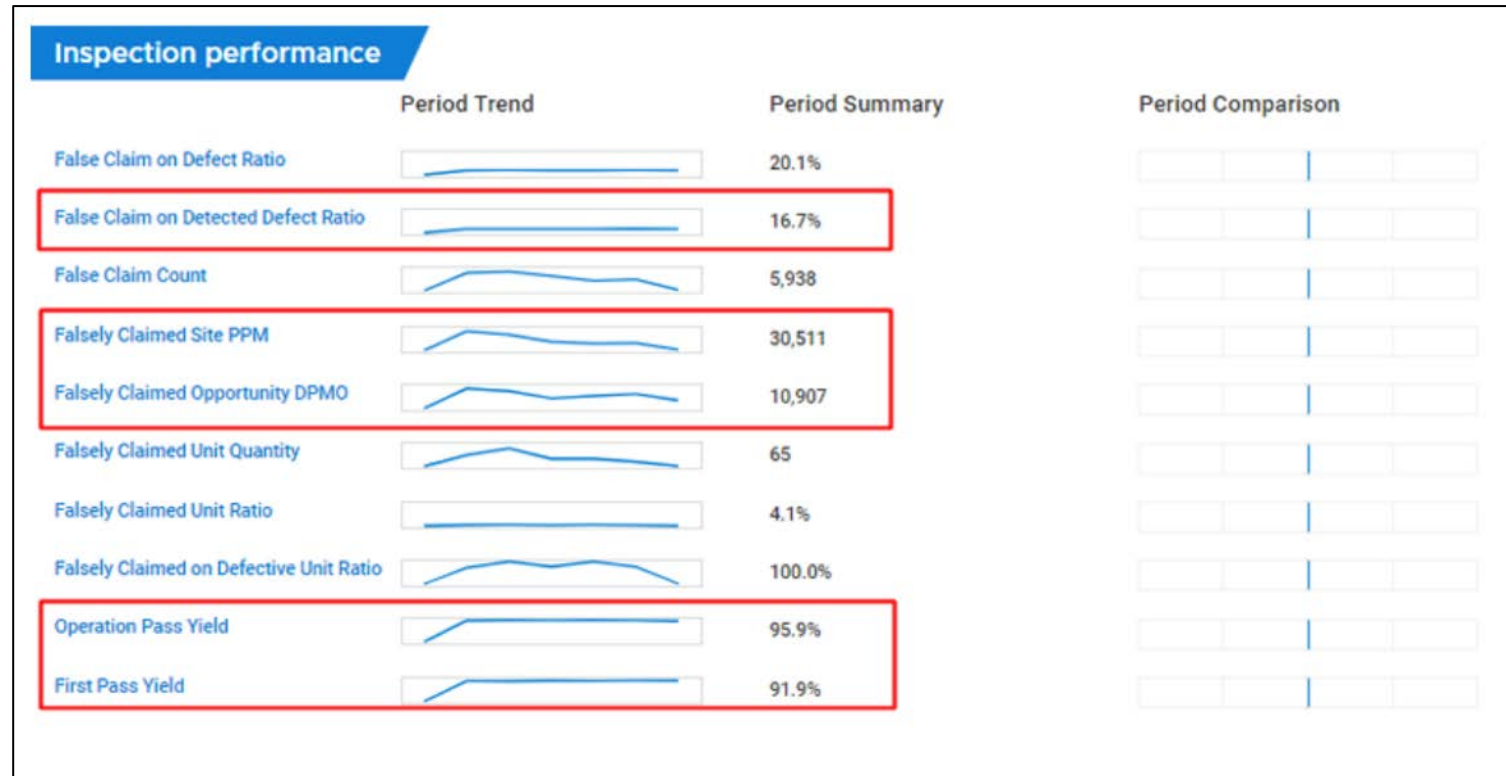




FI Analytics: New KPIs

OEE Performance

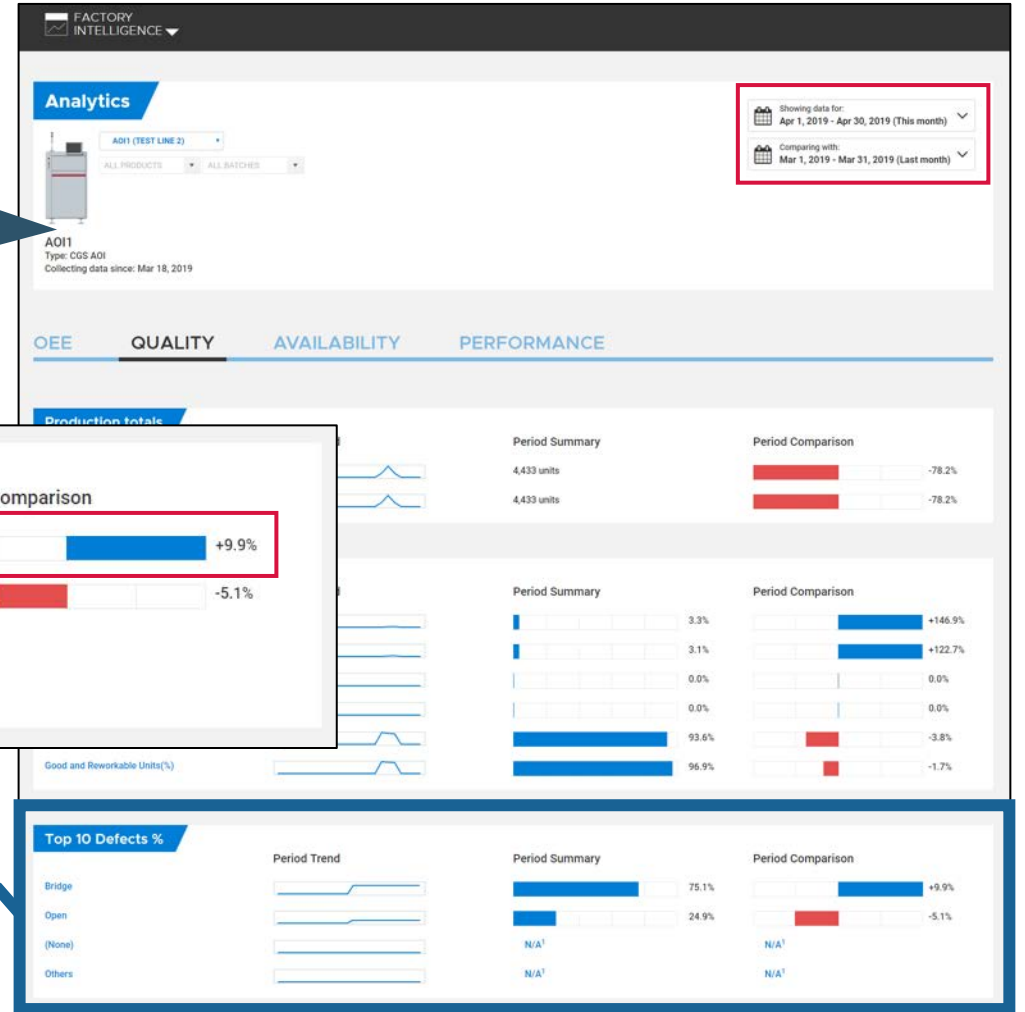
- New KPI's added September 2019 for Inspection Machines
- Inspection Performance
 - False Claim on Detected Defect Ratio
 - Falsely Claimed Site PPM
 - Falsely Claimed DPMO
 - Operation Pass Yield
 - First Pass Yield





FI Analytics: In Action

Compare AOI Defects for a specific assembly from month to month.



Soldering Bridging Defect increased 9.9% from March to April for same assembly.
What went wrong?

Technician to investigate!
Was the solder paste changed?
Verify stencil condition?
Verify Machine alignment?

FI Analytics: Customized Reports

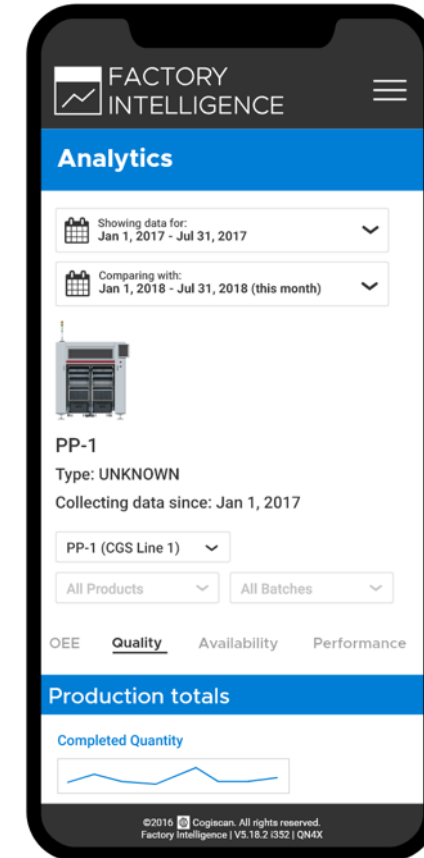
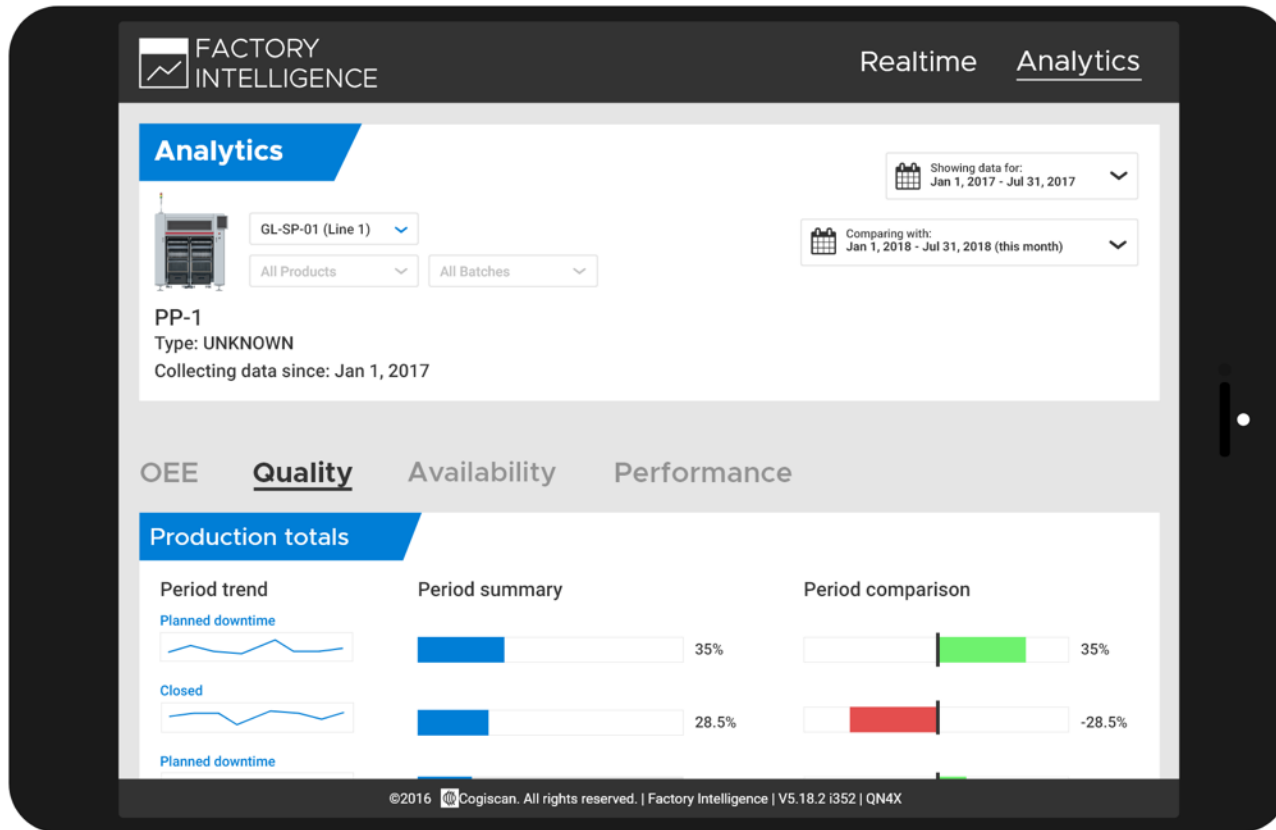
Take control – develop your own customized reports and dashboards!

- **Gain access to FI Analytics' underlying data sources using an OLAP Layer or RESTful API to...**
 - Build custom, live dashboards and reports using Microsoft Excel
 - Share data with a 3rd party Business Intelligence tool (e.g., Tableau)



Mobile-Friendly Display

Responsive display automatically adjusts to the proper screen size



Factory Intelligence: In Action



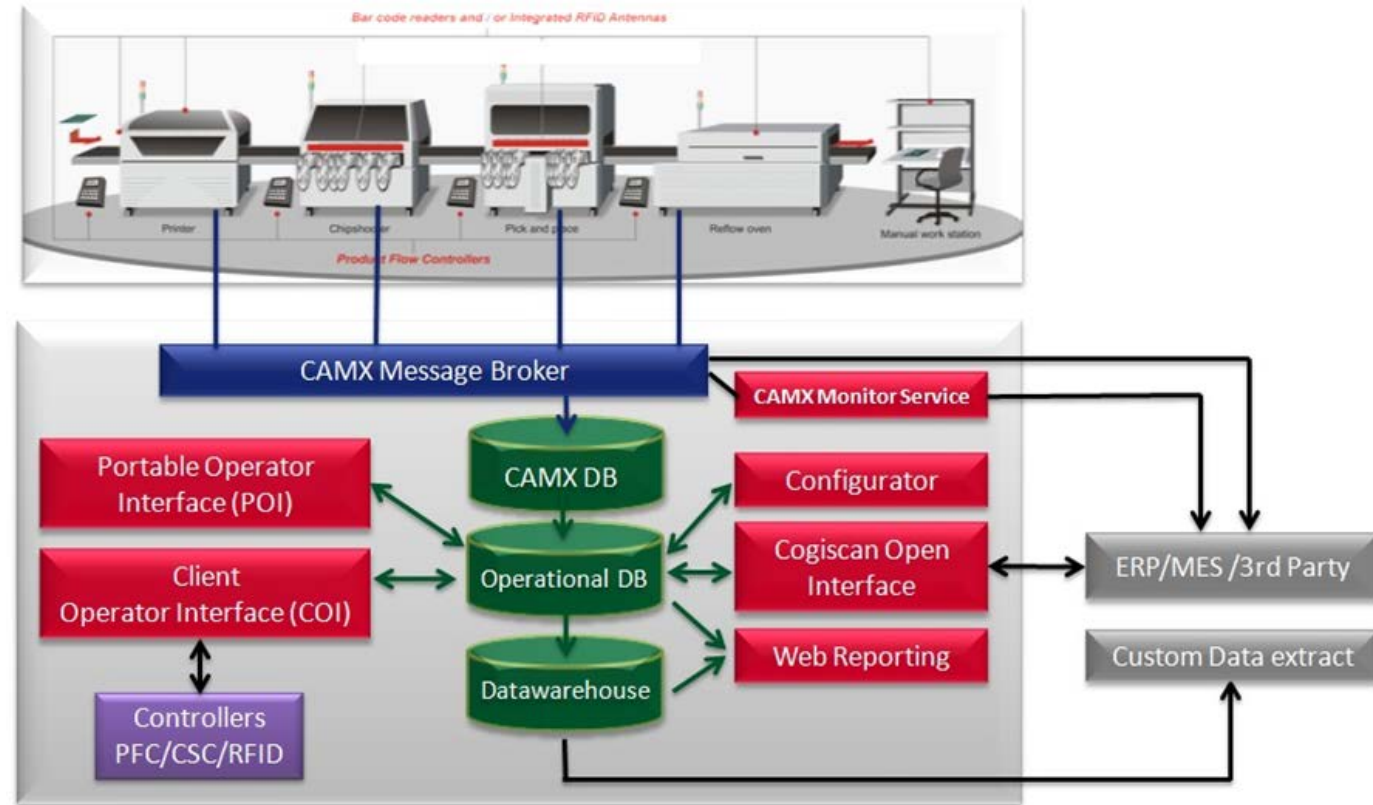
// Factory Intelligence aligns with our Smart Factory goals... this software puts information in the right place at the perfect time. This faster flow of information is critical to our production planning. //

Jason Sciberras,
VP of Manufacturing
Saline Lectronics

Enterprise Integration

Seamless integration with ERP, MES, in-house and 3rd-party SW systems

- Exchange order, product, material info with enterprise systems
- RPC web-service interface for synchronous communication with external systems
- Comprehensive Data Warehouse for custom reporting, data harvesting, or ETL to other database systems
- Specialized interfaces for commercial MES solutions (e.g., Dassault DELMIA Apriso, iTAC, iBASET Solumina)



New Product: TTC GO!

New Portable Operator Interface

- **A faster, more efficient, and error-proof application**
- Operators require simple and intuitive tools to run production!
- Completely redesigned application to take full advantage of Android 7+ supported mobile devices
 - **Recommend:** Honeywell CT60, Android 7.1.1; & Zebra TC 51, Android 7.0
- Cogiscan users can download & upgrade for **FREE**

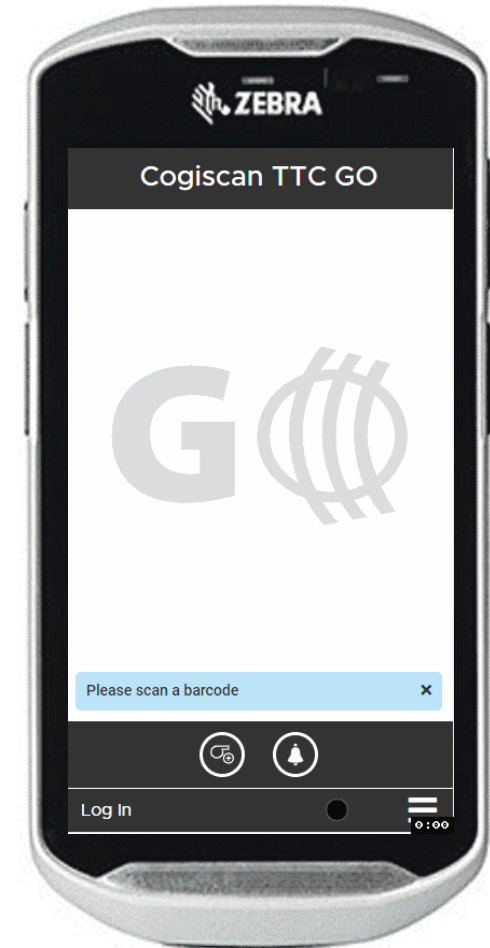
* with valid service contract



TTC GO! Benefits

Modern, Intuitive & Simple

- **Simplify production tasks** with a modern and user-friendly handheld interface with intuitive navigation features
- **Leverage flexibility** by downloading the **free** app on any Android supported device
- **Upgrade outdated technology** that will no longer be supported by PDA vendors
- **Save hardware costs** by utilizing modern, reliable, and less expensive devices that can be easily upgraded



TTC GO! Supported Hardware

Honeywell (Android 7+)

- **CT 60**
- CT40
- EDA50
- EDA51
- EDA60K
- EDA70

Zebra (Android 7+)

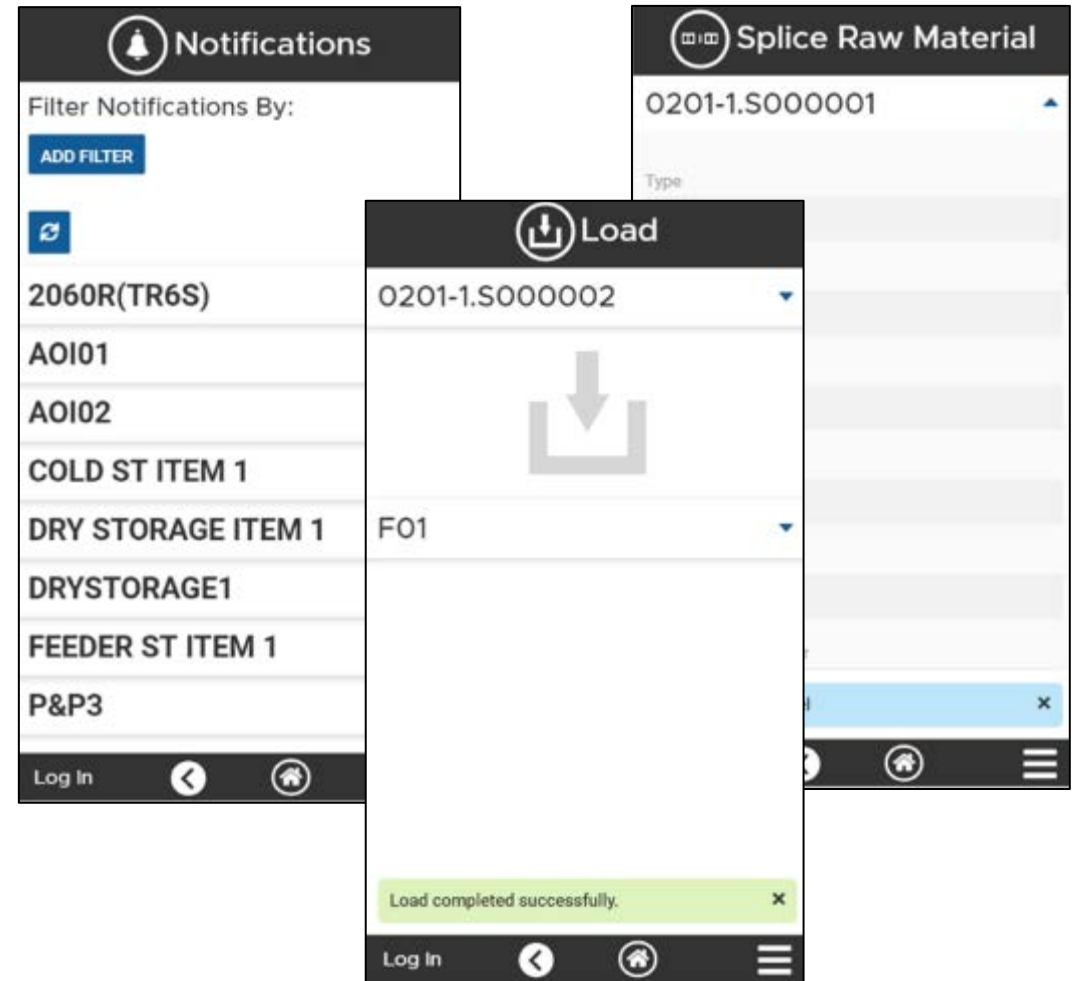
- **TC 51**
- MC33
- PC20
- TC20
- TC25
- TC52
- TC56
- TC57
- TC70x
- TC72
- TC75x
- TC77
- VC80x
- WT6000



TTC GO! Features

Intelligent and contextualized performance

- **Context driven functionality:**
 - Intuitive guidance for Operators when they scan within the app they will be presented with contextually appropriate screens
 - **Saves Operators time!** No need to scroll through to find the required task button

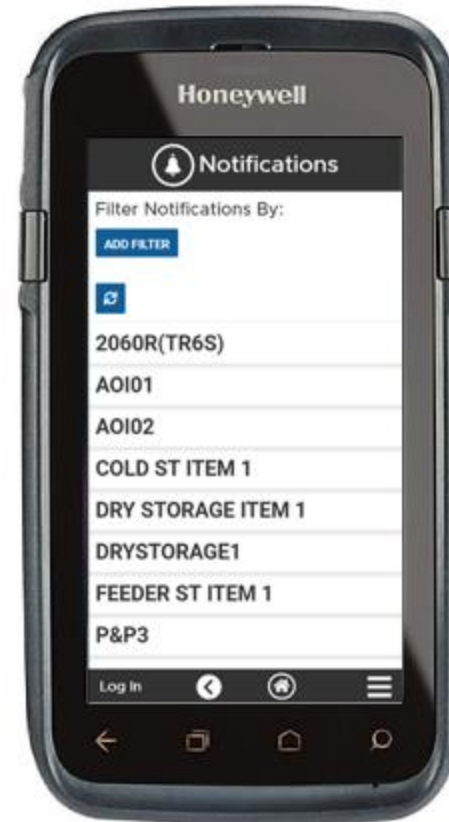


TTC GO! Functionality

Critical production tasks performed intuitively, quickly & efficiently

- **Initial Release:**

- PCB Scan
- Material Initialization
- Loading/Unloading
- Reel Splicing
- Factory Notifications



- **Phase II - Coming Soon:**

- Low-level Warning
- Quantity Editing
- Raw Material Splitting
- Line state
- Kitting



Typical Sales Process

Phase	Description
General introduction of company and product	Identify specific interests and needs
Specific product presentations	Confirm specific interests and needs
Budgetary estimate	Confirm budget
Site visit with apps engineer	Detailed analysis of process and equipment
Statement of Work (SOW)	Define solution, pre-requisites, special requirements, implementation plan
Final quotation	Incl. sw licenses, hardware, services, support and special requirements
Purchase	Development of special requirements, implementation, training



Thank you!



For more information

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