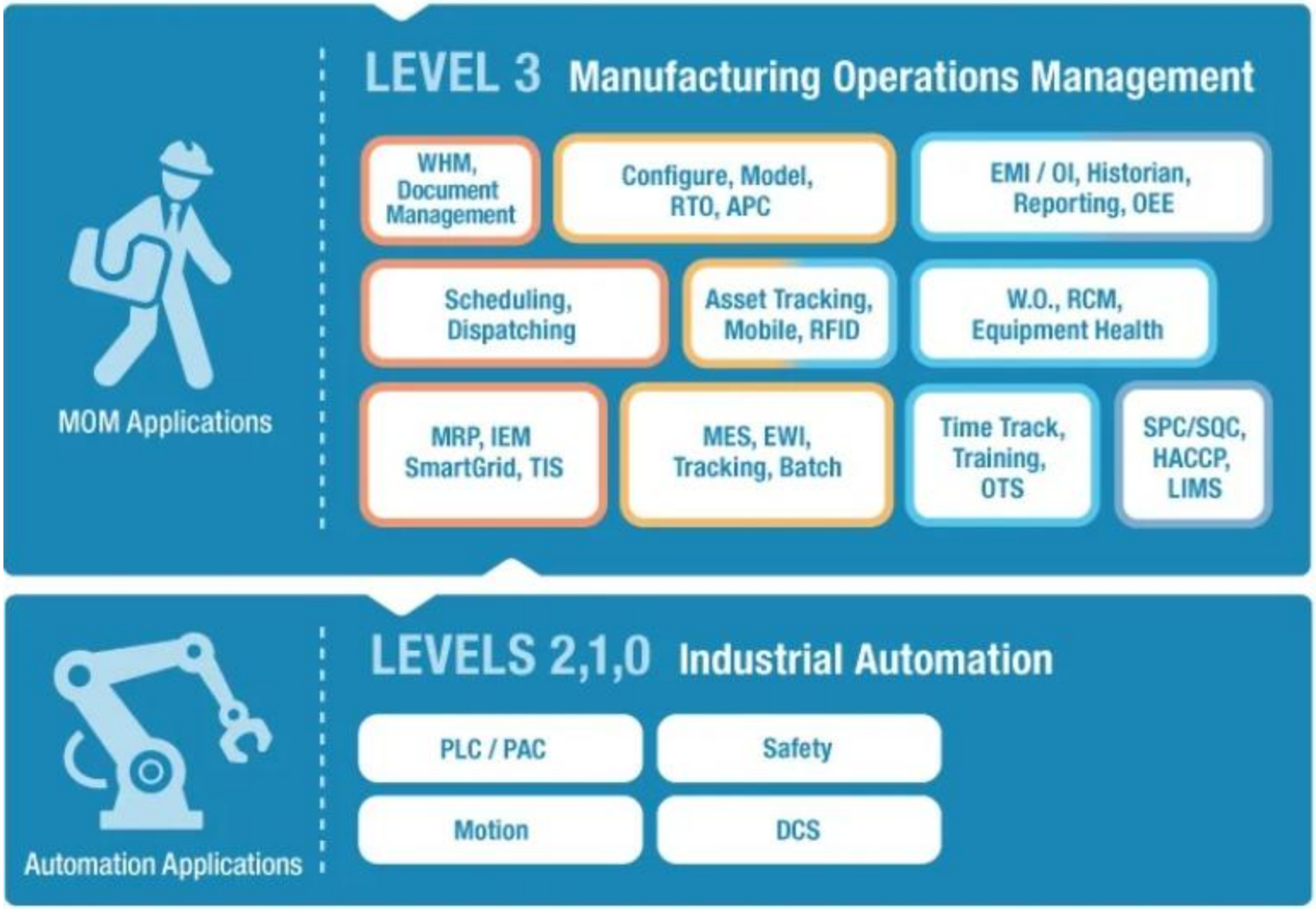
Plantwatch®

PC Based Traceability & Control

MARK READ TRACK

Where Plantwatch sits



- Plantwatch is server software that acts as the hub for everything on your plant floor for total system integration. No matter what brand, model, or platform, it talks to your plant-floor equipment just as naturally as it talks to SQL databases, seamlessly bridging the gap between production and IT.

Tracking and Production Management system.

Common applications :
traceability, labor/job tracking, cell control, machine control, data collection, error proofing, inventory control , process management, operator interface and many more.

PlantWatch Users

- MTD
- Sealed Air
- TSM
- Cummins Fuel
- Cummins Engine
- Cummins JEP
- Ancor

- Gebbers
- Classy Closets
- Magneti Marrelli
- Magna Cosma
- Crown Group
- MSPrecision
- GM Toledo
- American Battery

What is PlantWatch ?

Plantwatch® is a simple to use PC based software that is configured to create MES Track and Control systems.

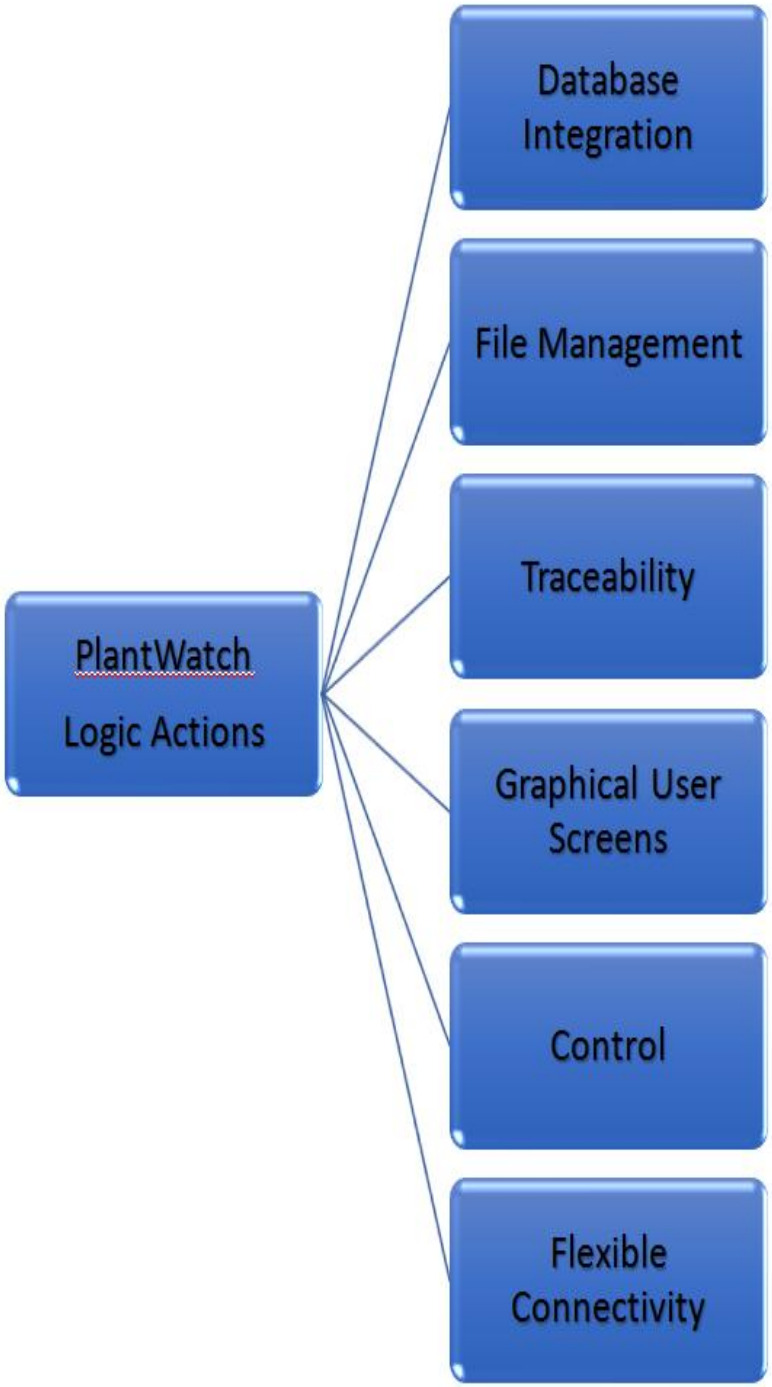
Plantwatch applications are deployed by Machine OEMS, System Integrators and end users as stand alone systems or to fill gaps in existing systems

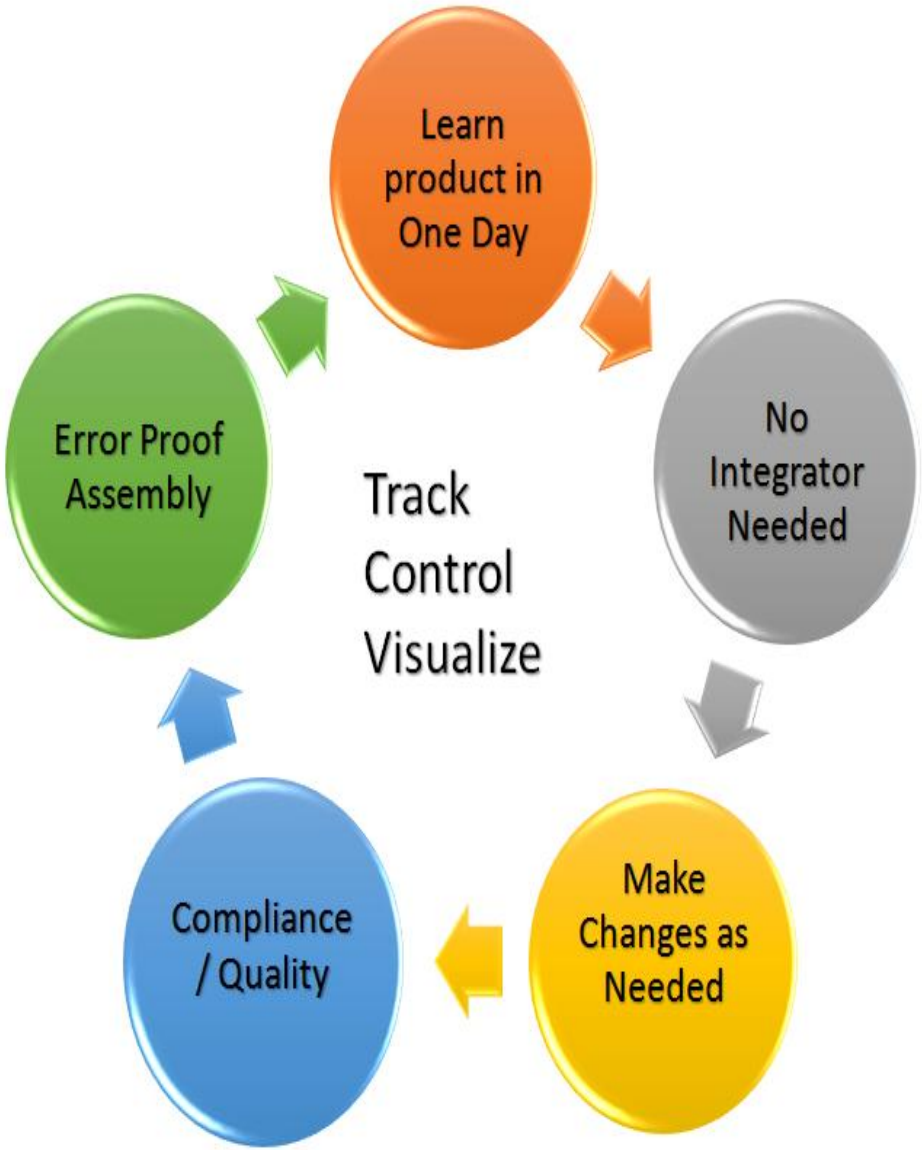
Plantwatch applications are configured with a simple interface that allows for quick deployment and expansion without outside support services.

. Control the simplest station or do plant wide traceability with one day of training!

- *Connect, communicate & control your process with simple radio button configuration*
- *Create in hours what usually takes weeks*

"So easy even an end user can do it"


PlantWatch
Logic Actions
Database Integration
File Management
Traceability
Graphical User Screens
Control
Flexible Connectivity


Learn product in One Day
No Integrator Needed
Make Changes as Needed
Compliance / Quality
Error Proof Assembly
Track
Control
Visualize

Where Does It Fit

- *Control*
  - *Manufacturing cell control and data collection*
  - *Communicate to control devices*

  PLC, Test cells, Robots, Conveyors, Sensors, Light Curtains, Motors and Drives, RF ID, Motion

- *Track*
- *Data Collection, geneology- Serialized or Lot,*
- *Database browser SQL, ODBC*
- *Bi-directional comm to higher level systems: MES/ERP*

Not just a data collector !!

Makes decisions and performs actions.

Whos buying it

OEMs/integrators

- Baumfolder
- CW Castle
- OAM
- Canon

Distributors

- Diskcomp
- Industrial Controls
- Smart Label Solutions

New End Users

- American Battery
- TSM 3
- Ancor
- Classy Closets
- Doxim
- Morris Dickson

Easily configured, learn it in one day!

Plantwatch® systems are so understandable that you can learn everything you need to know in one day!


ERP Workorder #6643892
Operation
Required File
Recipe
Result
Mark
Verify
Form
Assy Gear
Assy Bushing
Test
Label
Pack
Your Company
Workorder
Mark
Verify
Manufacture
Test
Package
GEAR ASSEMBLY
PN: 44451
LOT: 486
UID: INN5383942
BUSHING ID: .499in
OK TO SHIP

Network client

Plantwatch Is Different

In Plantwatch…
It's easy to do complex things!

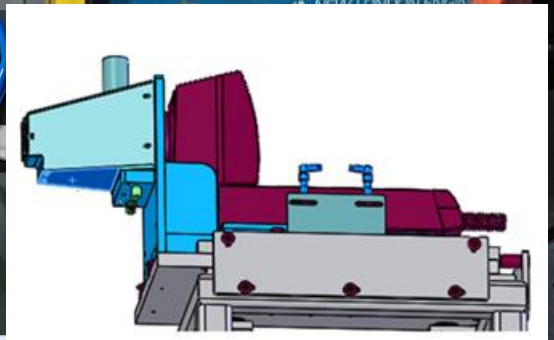
- Easy
  - No programming
  - One day training
  - Live Monitor
  - Cross reference tool
- Powerful
  - Logic engine is unique
  - Remote .exe
- Interacts with other PC based systems
  - Send/Receive to ERP
  - Multi-User

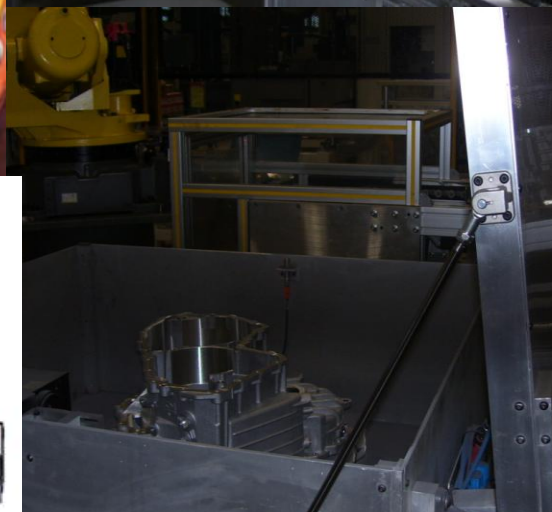
Powerful

- Connects to everything, easily!
  - ✓ OPC for PLC's etc
  - ✓ Com Ports
  - ✓ TCPIP Sockets
  - ✓ Files from other software applications
  - ✓ Databases
  - ✓ I/O
  - ✓ Network Clients
  - ✓ Remote .EXE

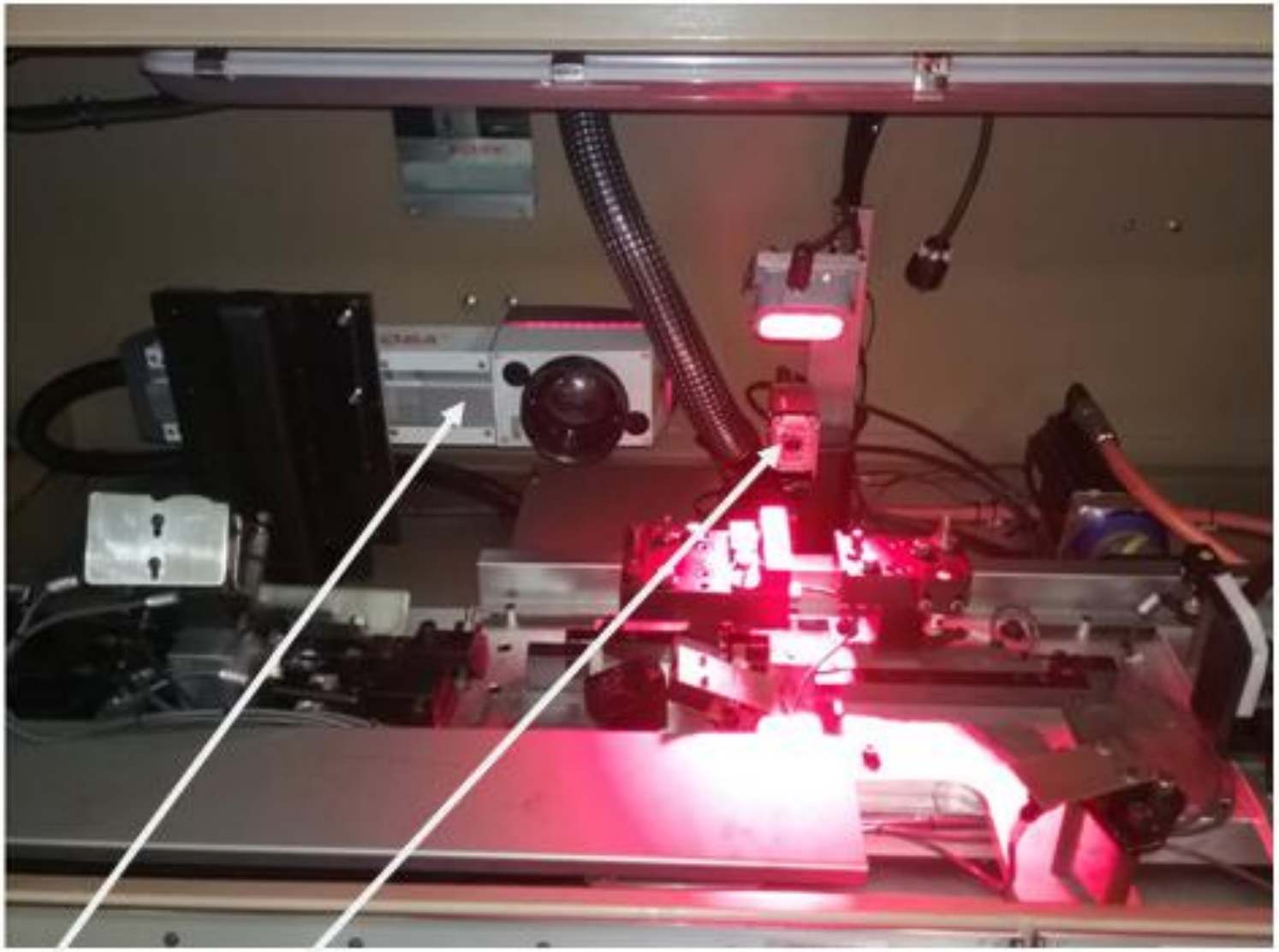

FOBA


405





Marking Machine interior

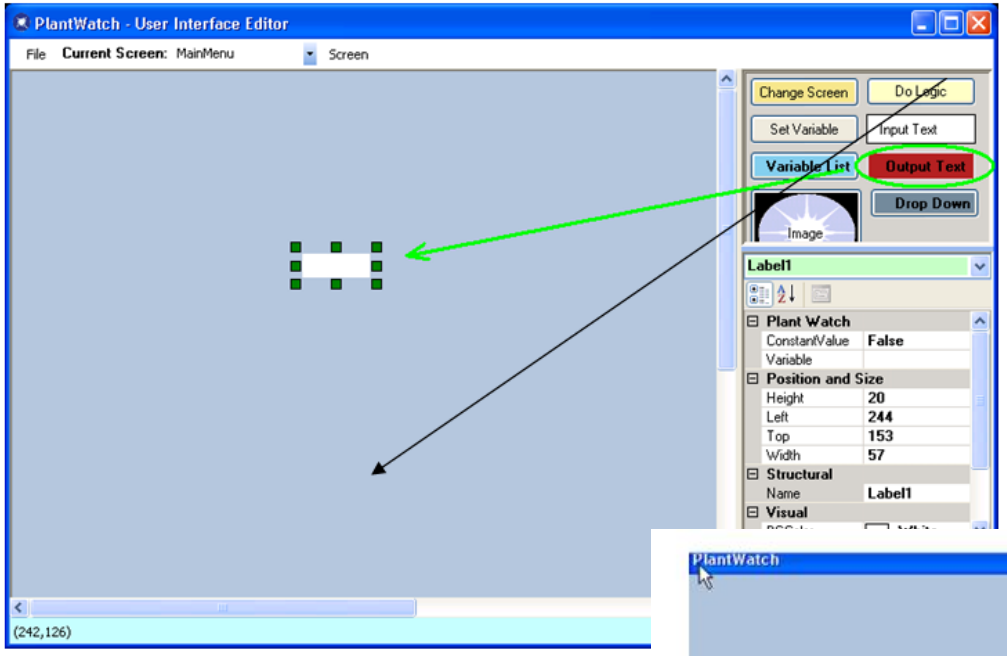


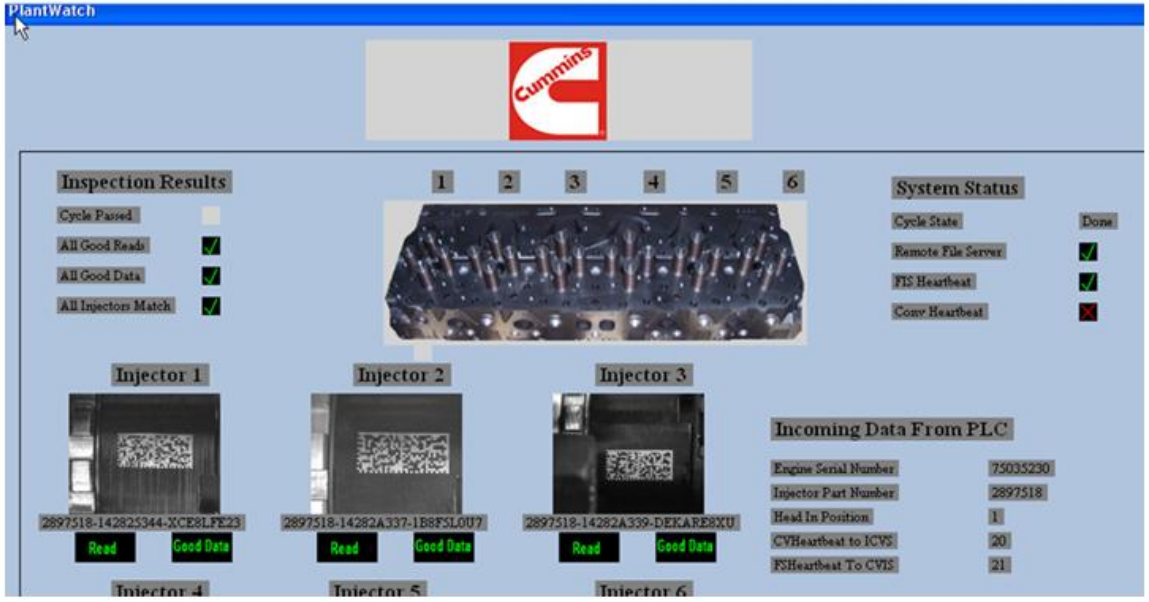
Laser / Verification camera

The Plantwatch system collects data from the marking machine for each unique part.

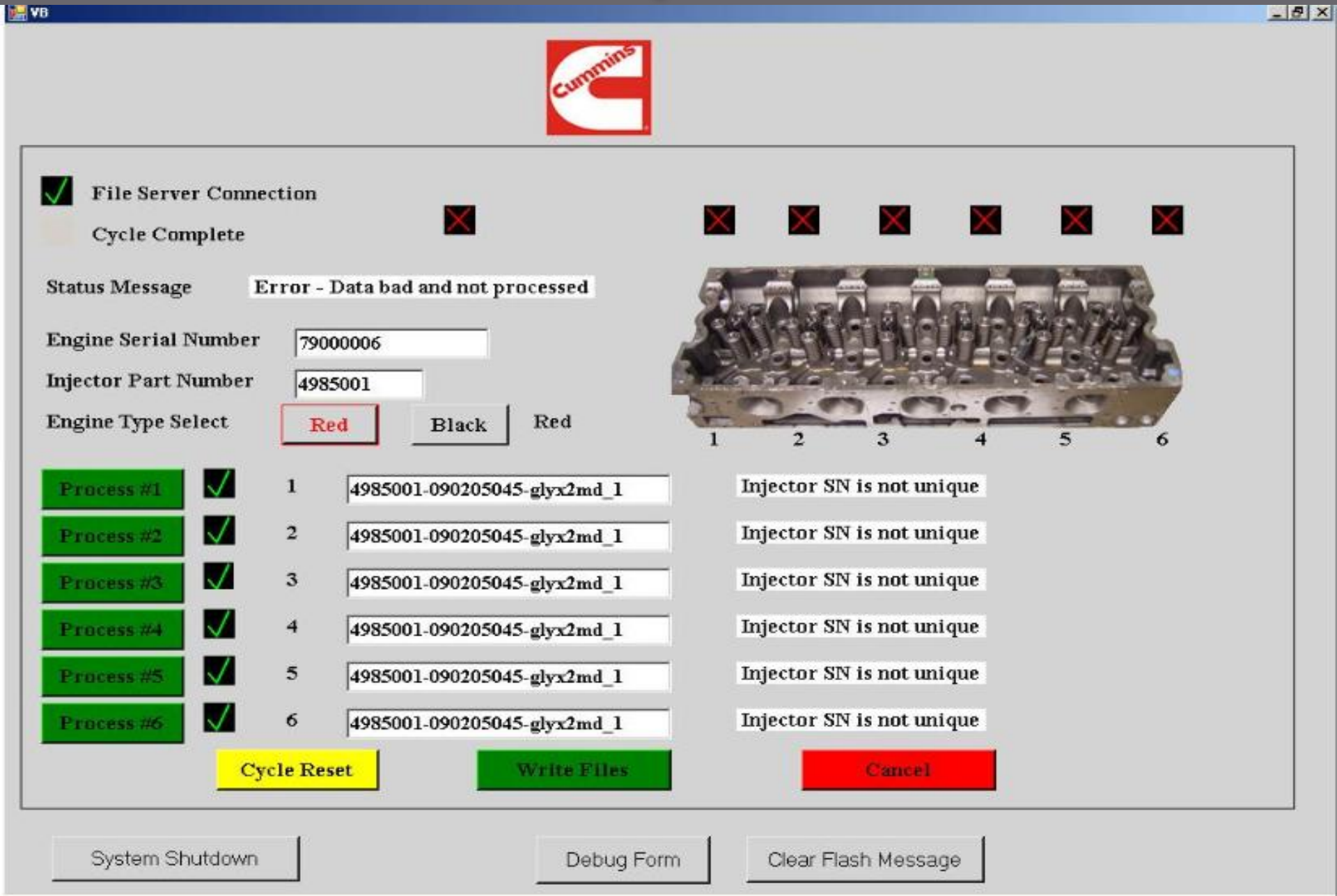
Graphic Designer

Input text, output text, animated buttons, selection boxes,

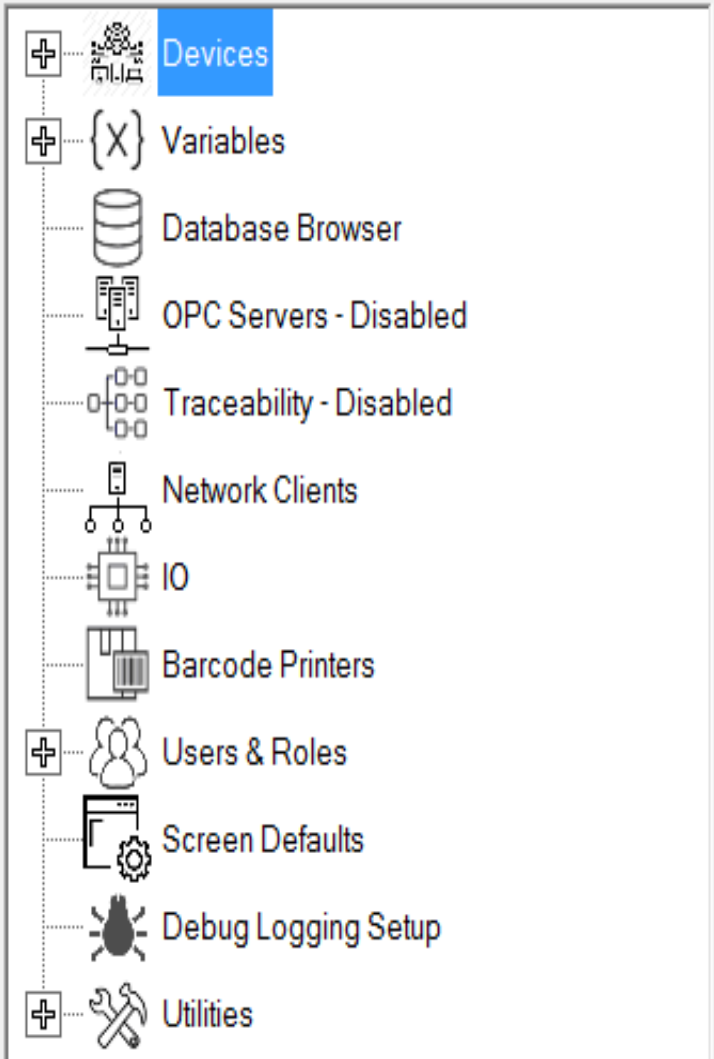




Graphics


VB
Cummins
File Server Connection
Cycle Complete
Status Message
Error - Data bad and not processed
Engine Serial Number
79000006
Injector Part Number
4985001
Engine Type Select
Red
Black
Red
1
2
3
4
5
6
Process #1
Process #2
Process #3
Process #4
Process #5
Process #6
1
2
3
4
5
6
4985001-090205045-glyx2md_1
Injector SN is not unique
Cycle Reset
Write Files
Cancel
System Shutdown
Debug Form
Clear Flash Message

Plantwatch



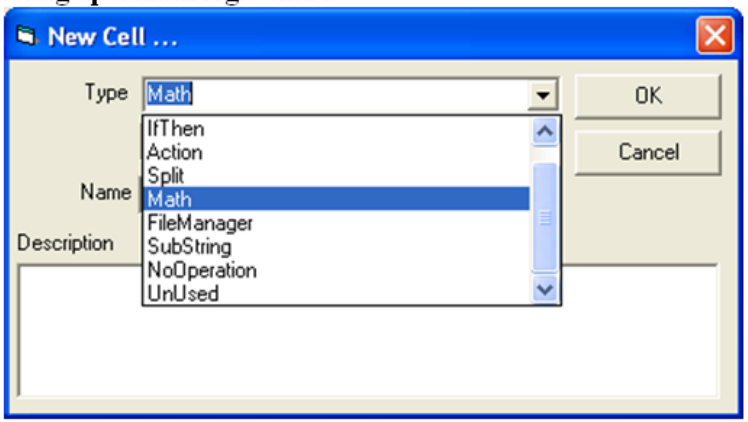
Editor

Tree View

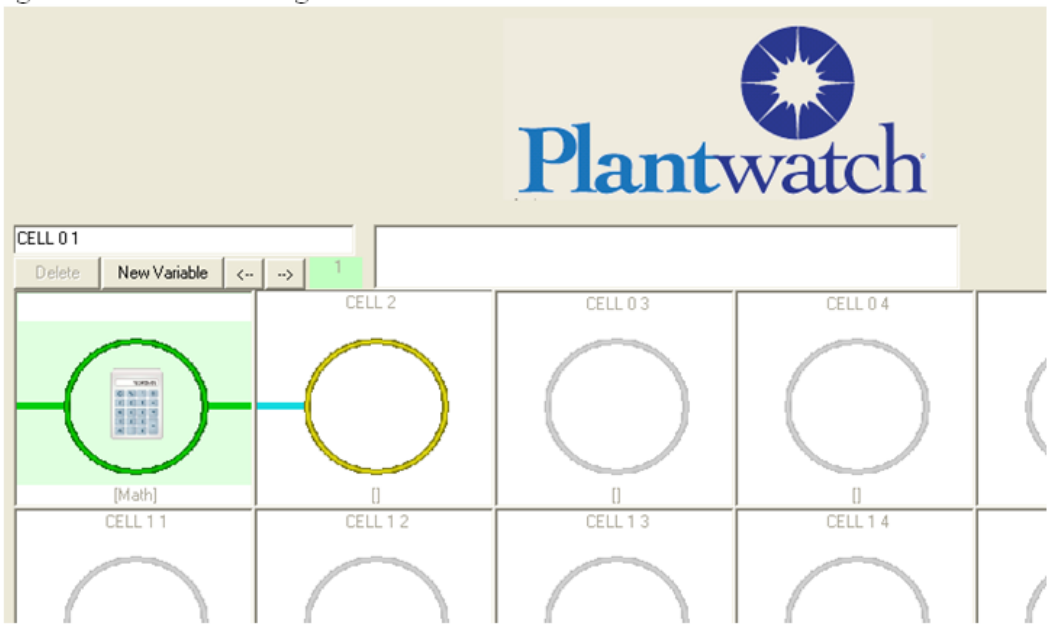
Tree View allows you to add or delete components from you application such as:
Devices to talk to, for example a camera, bar code reader or PLC
Local variables to store values
Logic Charts to perform logic and cause real world actions
SQL Databases to connect to for data storage
Bar Code printers
Digital I/O 24 vdc

Logic Engine

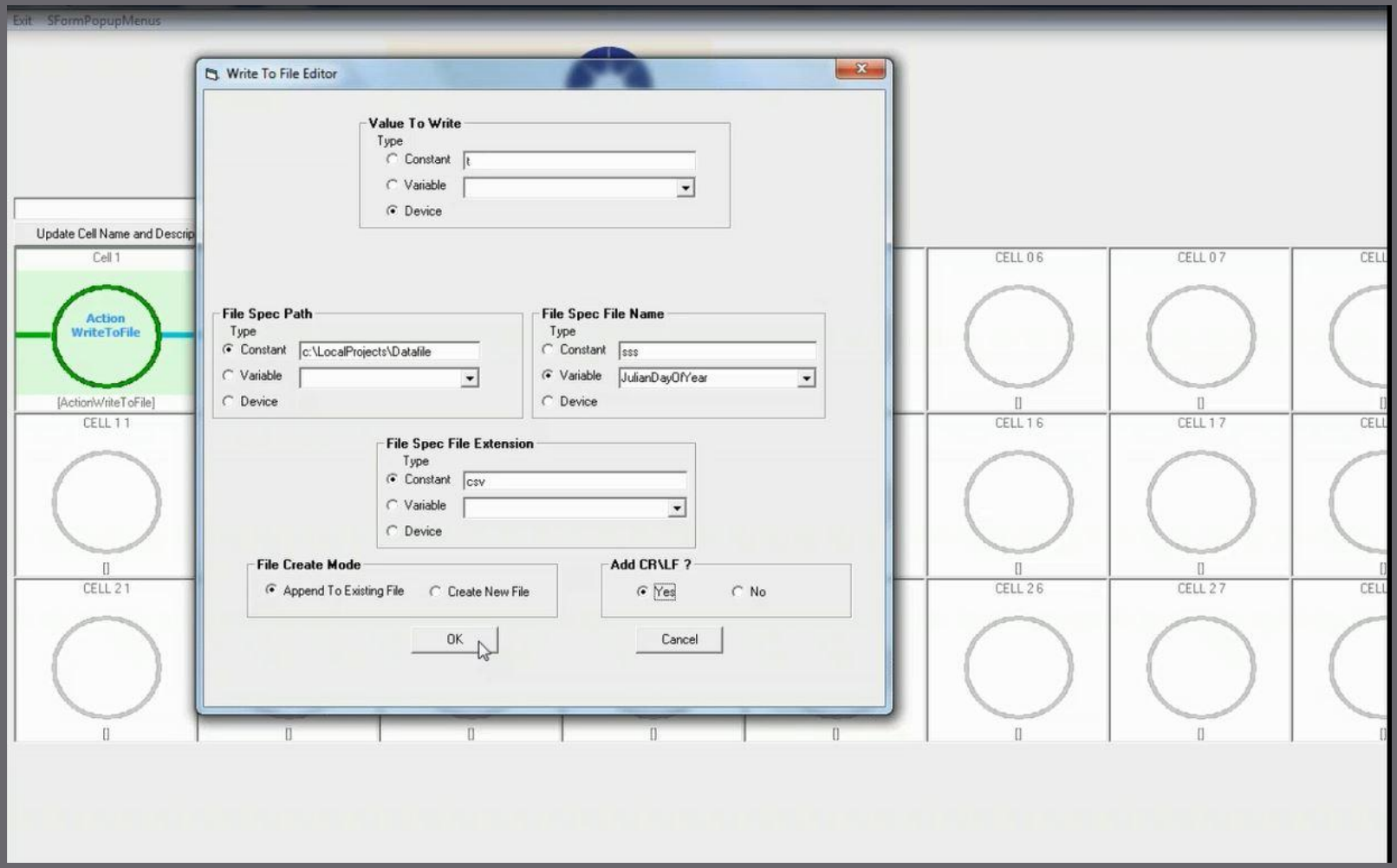
Setting up a math logic chart

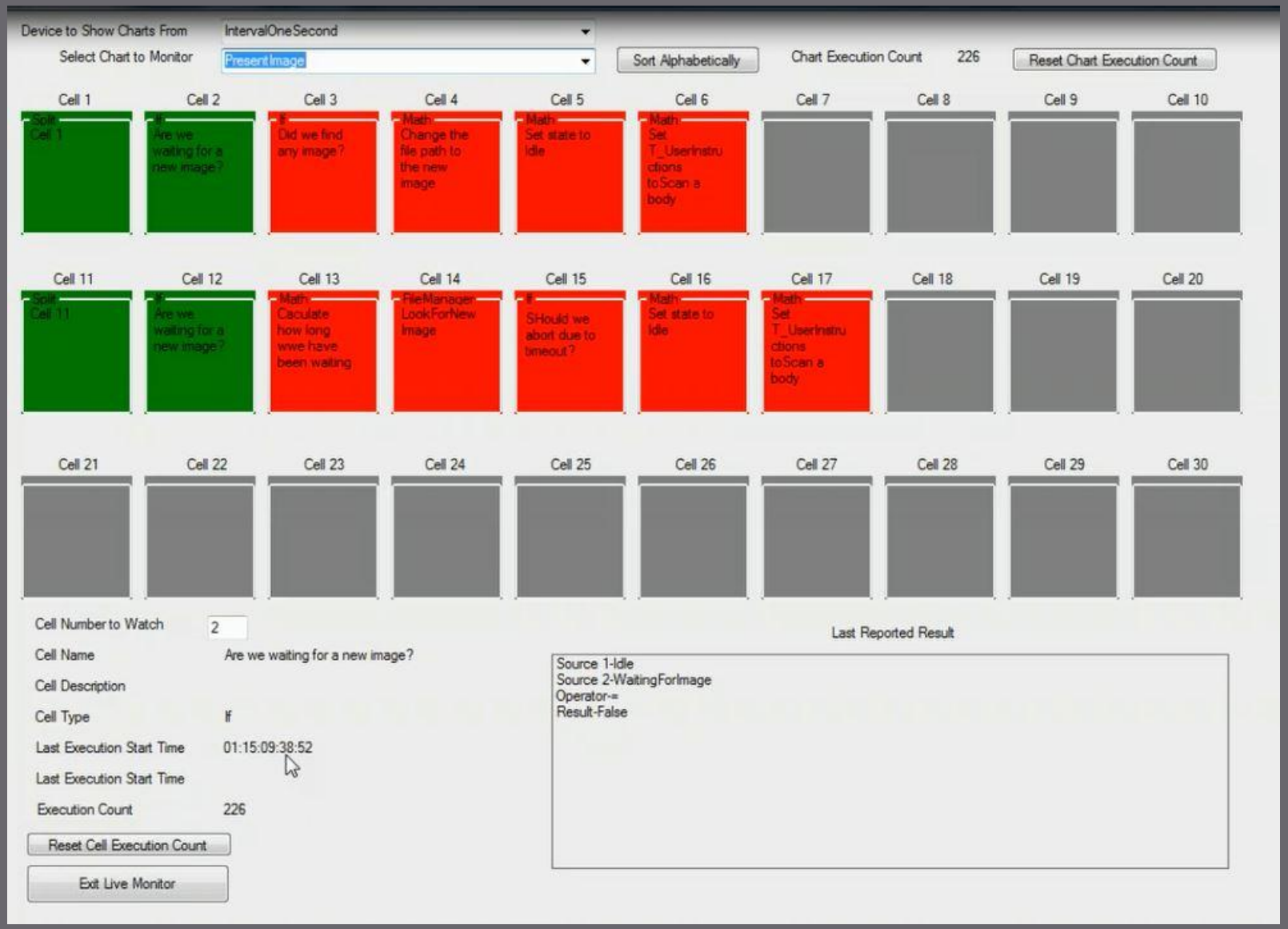


Logic flows from left to right

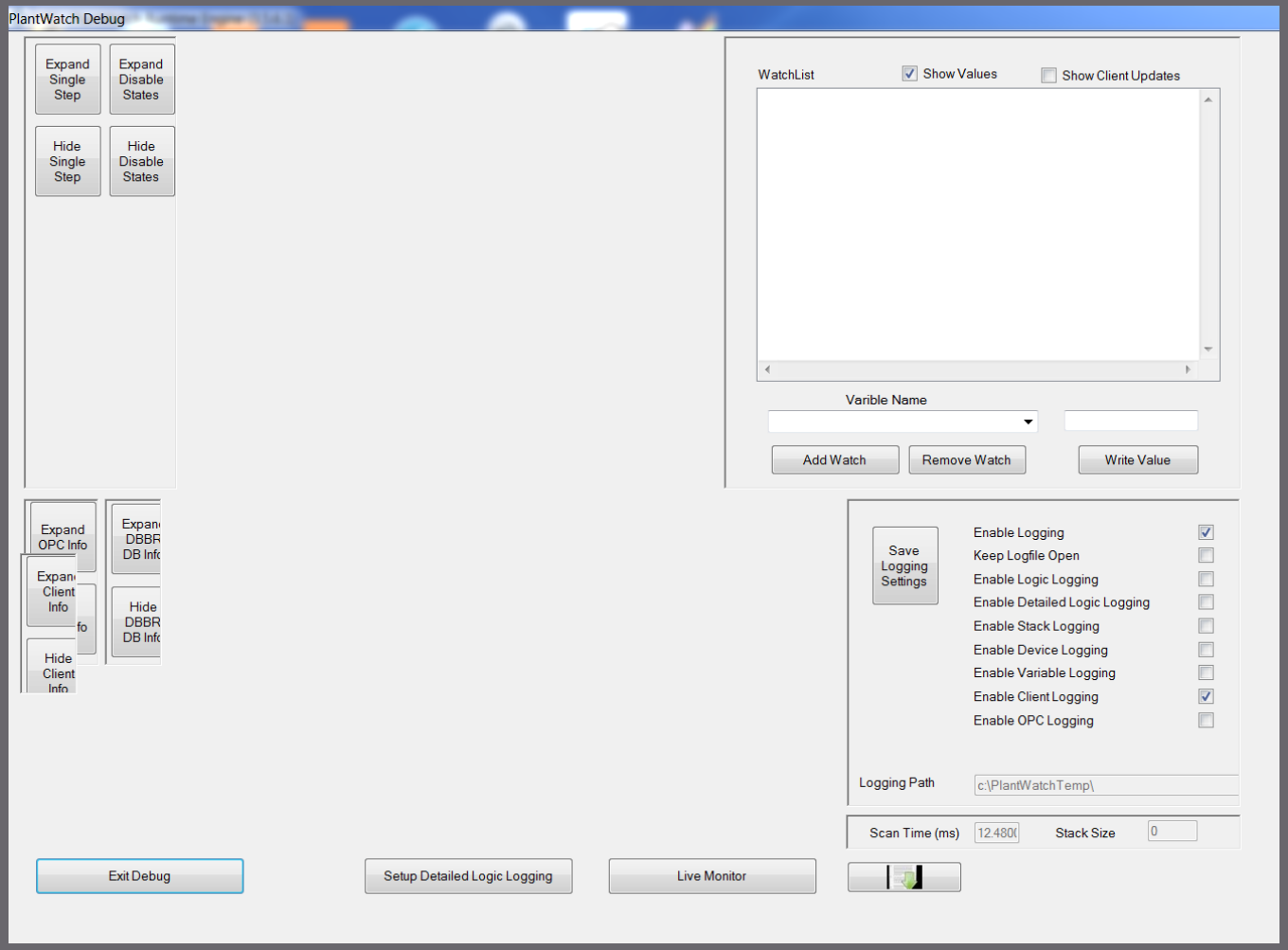


Development




Device to Show Charts From
IntervalOneSecond
Select Chart to Monitor
PresentImage
Sort Alphabetically
Chart Execution Count
226
Reset Chart Execution Count
Cell 1
Split
Cell 1
Cell 2
If
Are we waiting for a new image?
Cell 3
If
Did we find any image?
Cell 4
Math
Change the file path to the new image
Cell 5
Math
Set state to Idle
Cell 6
Math
Set T_UserInstructions toScan a body
Cell 7
Cell 8
Cell 9
Cell 10
Cell 11
Split
Cell 11
Cell 12
If
Are we waiting for a new image?
Cell 13
Math
Caculate how long wwe have been waiting
Cell 14
FileManager
LookForNew Image
Cell 15
If
SHould we abort due to timeout?
Cell 16
Math
Set state to Idle
Cell 17
Math
Set T_UserInstructions toScan a body
Cell 18
Cell 19
Cell 20
Cell 21
Cell 22
Cell 23
Cell 24
Cell 25
Cell 26
Cell 27
Cell 28
Cell 29
Cell 30
Cell Number to Watch
2
Cell Name
Are we waiting for a new image?
Cell Description
Cell Type
If
Last Execution Start Time
01:15:09:38:52
Last Execution Start Time
Execution Count
226
Reset Cell Execution Count
Exit Live Monitor
Last Reported Result
Source 1-Idle
Source 2-WaitingForImage
Operator-=
Result-False

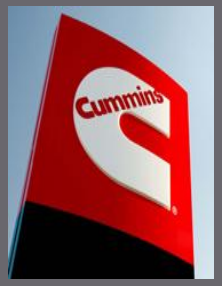
Live Debugging



Example – File Manager

Cummins needed to take data from 6 barcode readers and generate formatted Text files for an Engine Control Module Programmer.

PlantWatch was able to extract the data from the barcodes and from it generate the required text files as well as create the subdirectories needed to place the files in.



Example – OPC

An integrator needed to gather information from several addresses within a PLC and from it create Xcel report files.

PlantWatch was able to get the data out of the Siemens PLC, organize it and create the report files. Additionally, the data is present on the screen.

Example – Database Browser

A customer needed to record all of the components being added to a work order in a SQL Database based on barcode reader scans for 25 lines. This real time data is used to manage the flow of material to the 25 lines.

PlantWatch was able to connect and read the 25 barcode scanners and by using the Database Browser store all of the data into the customer's SQL database.

Example - IO

A customer wanted to improve the efficiency of its electro plating line by automatically adjusting the power being applied to the tank based on the type of part being processed.

PlantWatch was able to use it's IO subsystem to drive a 0 to 10 volt analog output to change the settings of the power being applied to the tank. It uses different recipes based on the part type identified by a Vision System

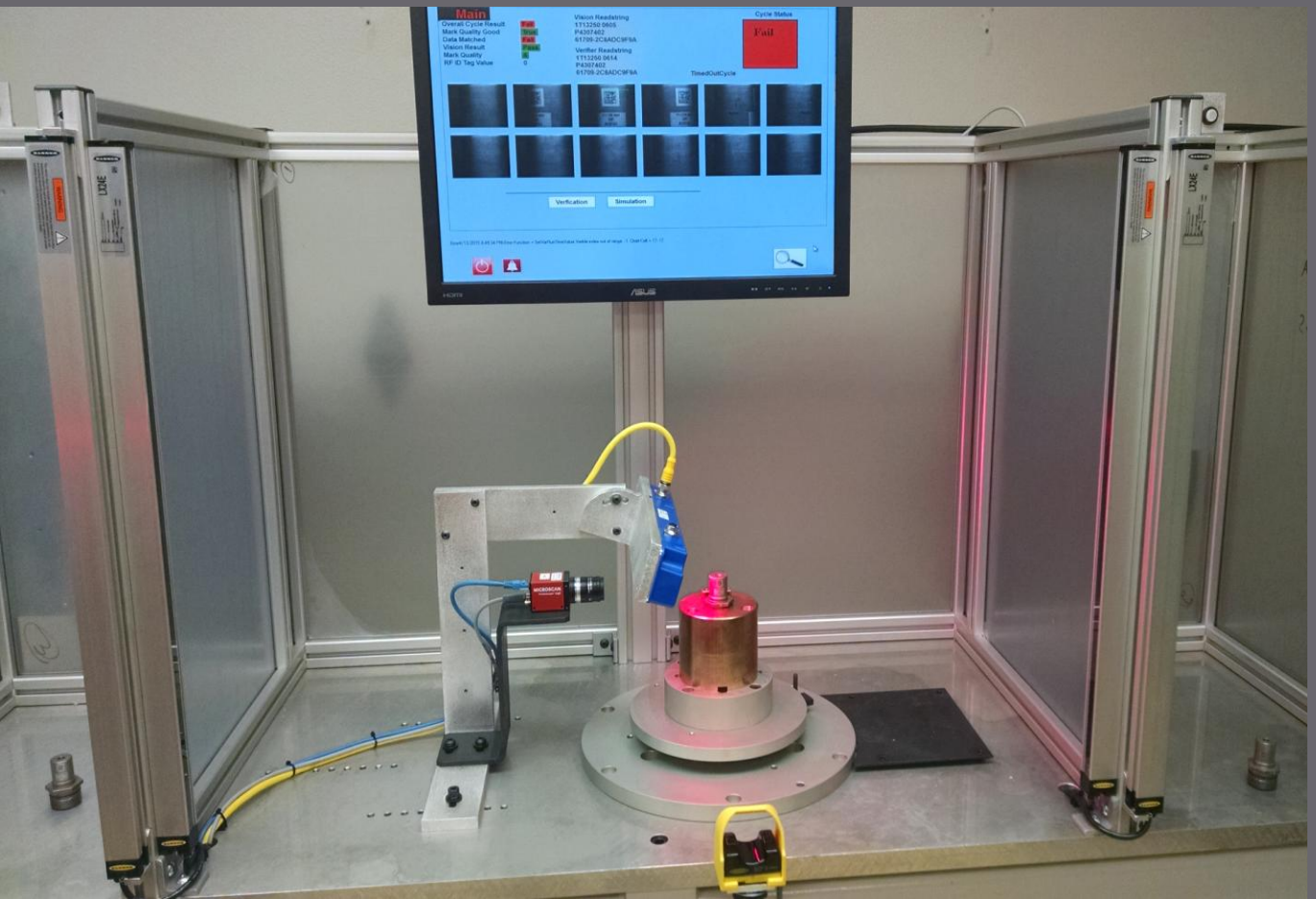
INJECTOR TRACEABILITY

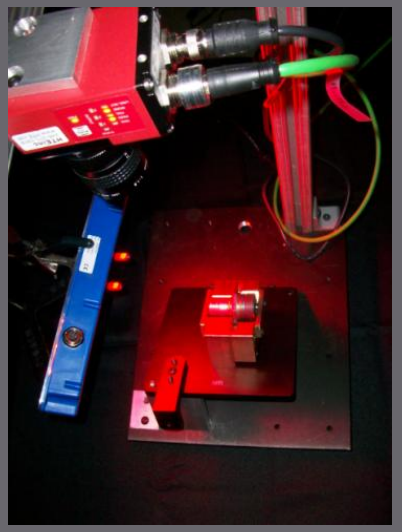
Verify data matrix mark quality

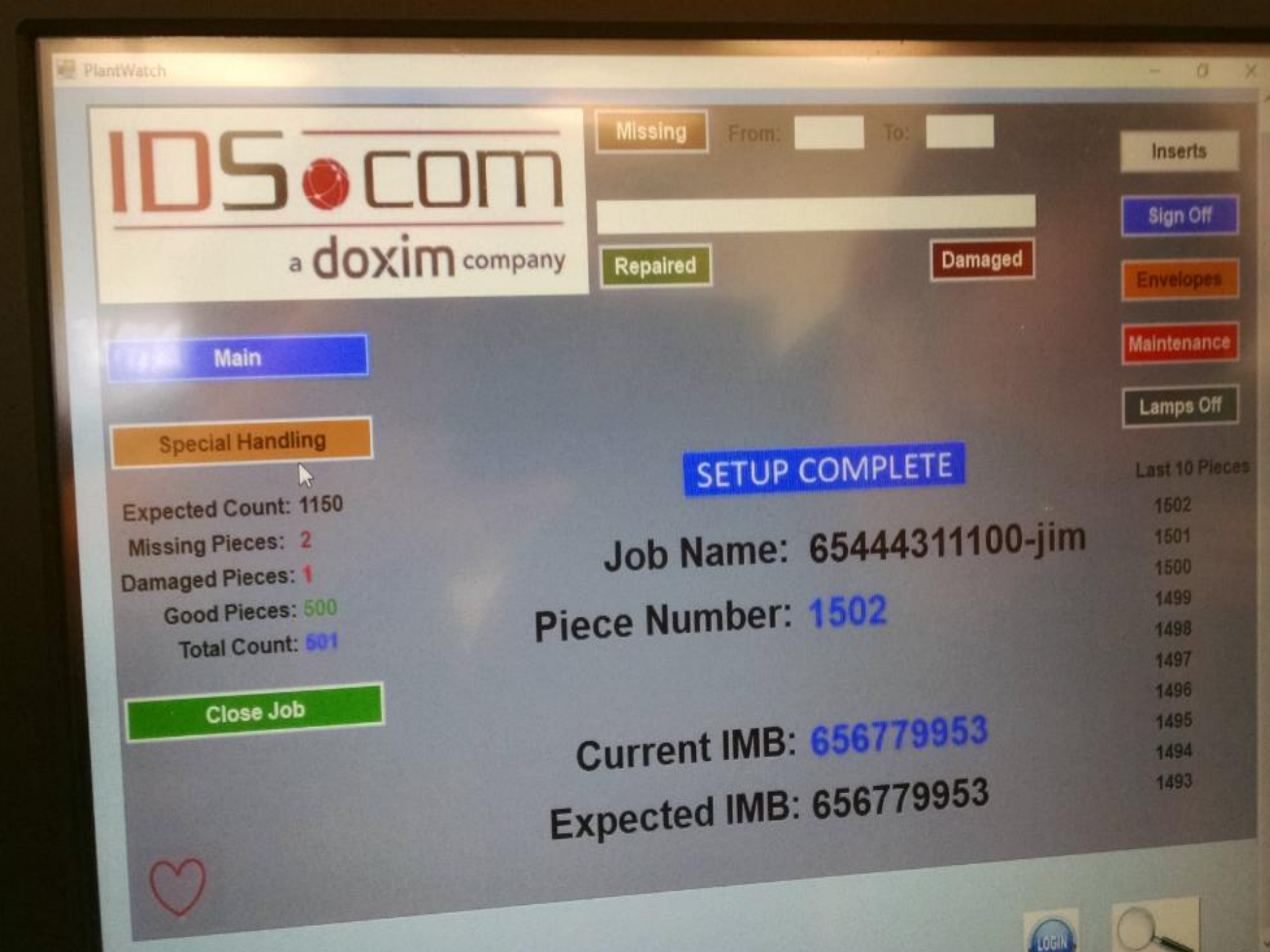
- Communicate to laser marker for correct part type
- Control station: light curtains, rf id tags, turntable

Control camera, trigger, save images

- Error proof part type

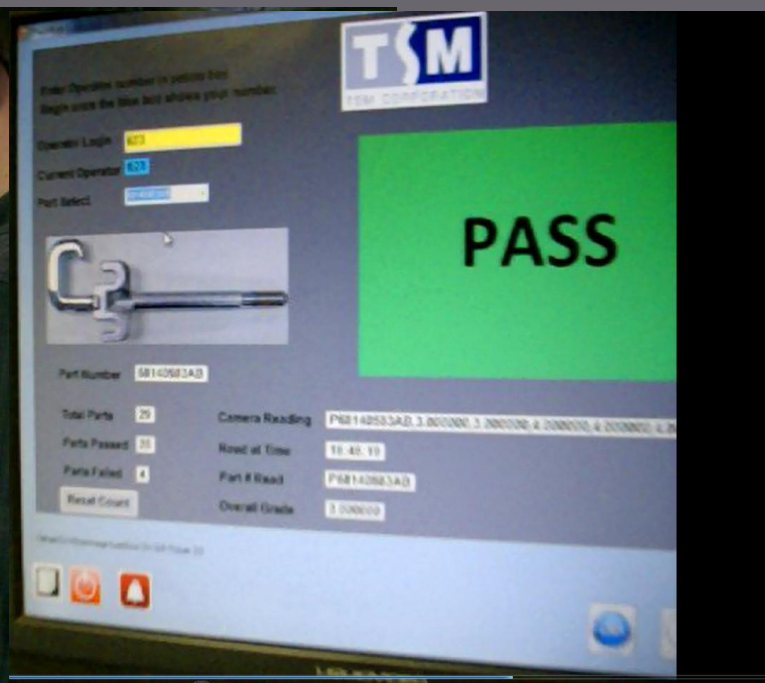





PlantWatch
IDS.com
a doxim company
Missing
From:
To:
Inserts
Repaired
Damaged
Sign Off
Envelopes
Maintenance
Lamps Off
Main
Special Handling
SETUP COMPLETE
Last 10 Pieces
Expected Count: 1150
Missing Pieces: 2
Damaged Pieces: 1
Good Pieces: 500
Total Count: 501
Job Name: 65444311100-jim
Piece Number: 1502
1502
1501
1500
1499
1498
1497
1496
1495
1494
1493
Close Job
Current IMB: 656779953
Expected IMB: 656779953

TSM Tow Hook

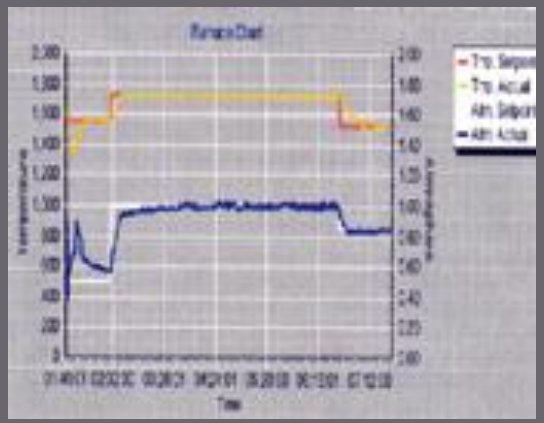
Plantwatch based Aim code quality verification system.
Controls camera /Triggers / error proofs operator / User Interface
Logs results /



Heat Treating TECHNOLOGIES·INC

DATA COLLECTION

- Data matrix verification DPM/logging
- Batch of serialized parts married to furnace data



ASSEMBLY REPLENISHMENT SYSTEM

We are currently using the Plant Watch product from HTE.
Our deployment takes data from over twenty scanners, processes the data with a rules based engine and then writes the information to a SQL database that support key business processes.
Plant Watch provided an activity dashboard to assess system and scanner activity.
We have found the HTE team to provide excellent technical support, and solid product training.
We found the price point and richness of the tool to exceed our requirements.

Christopher Gribben
Process Development and C I Manager MTD

20+ Scanners consume components

PW monitors component levels on line

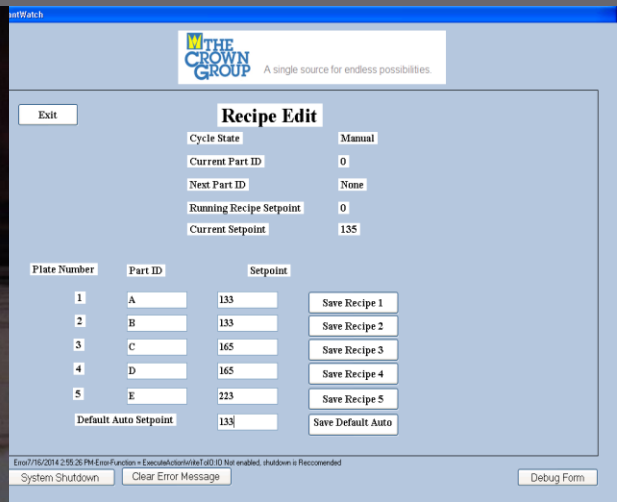
- Comm. to inventory system for replenishment

TRACEABILITY

- Communication to PLC
- Logging

ELECTROPLATING SYSTEM CONTROLLER

- Control the voltage within electroplating tank
- Set point is determined by using a Vision system to determine part type



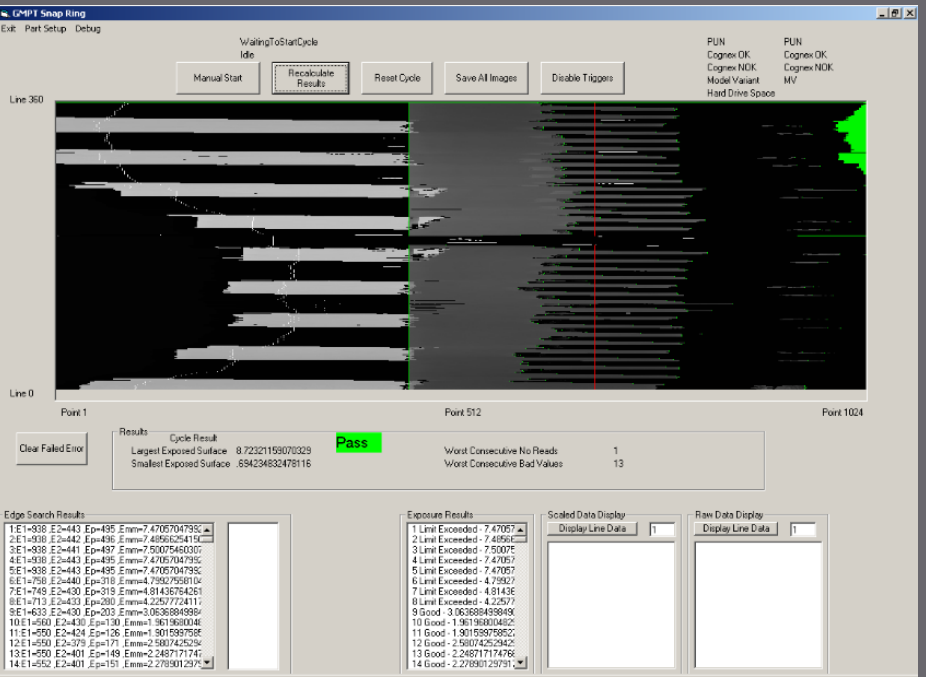
DATA COLLECTION FILE MANAGEMENT

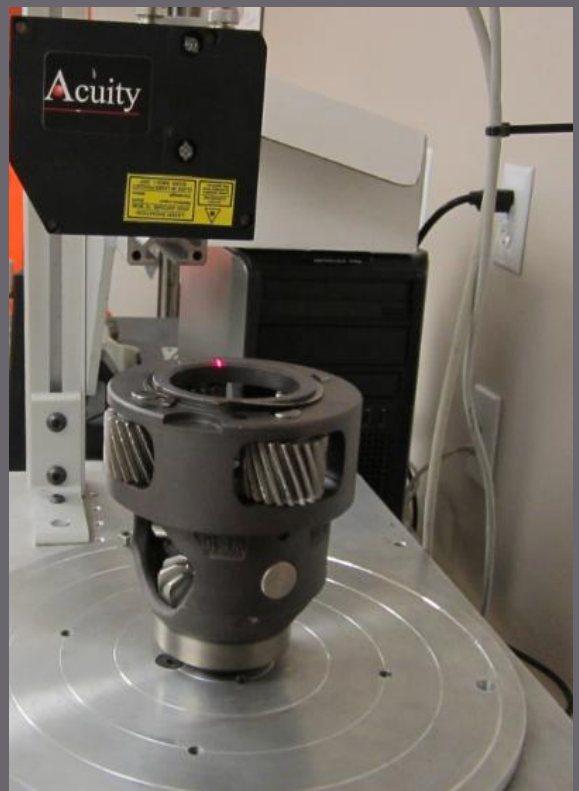
- Read data matrix on six injectors
- Relate injector to installed cylinder
- Create file with flow data parsed
- Send data for ECM programming

GMPT Toledo

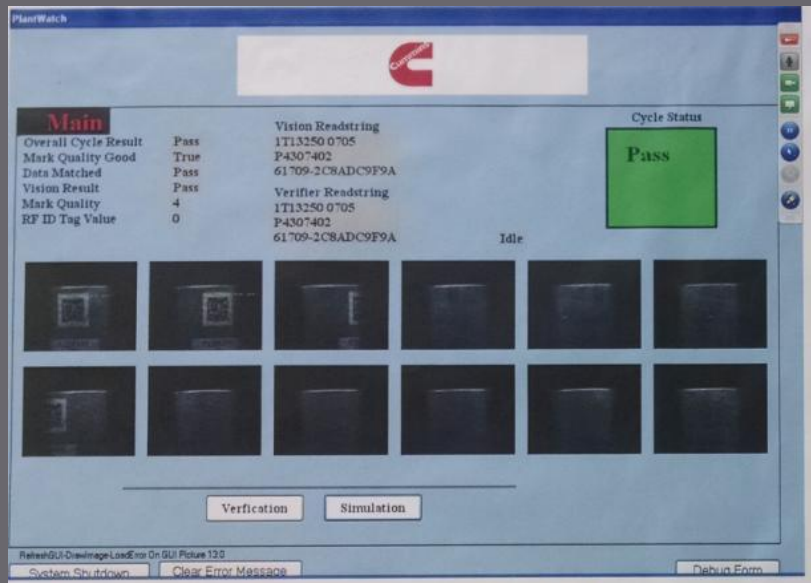
General Motors Powertrain

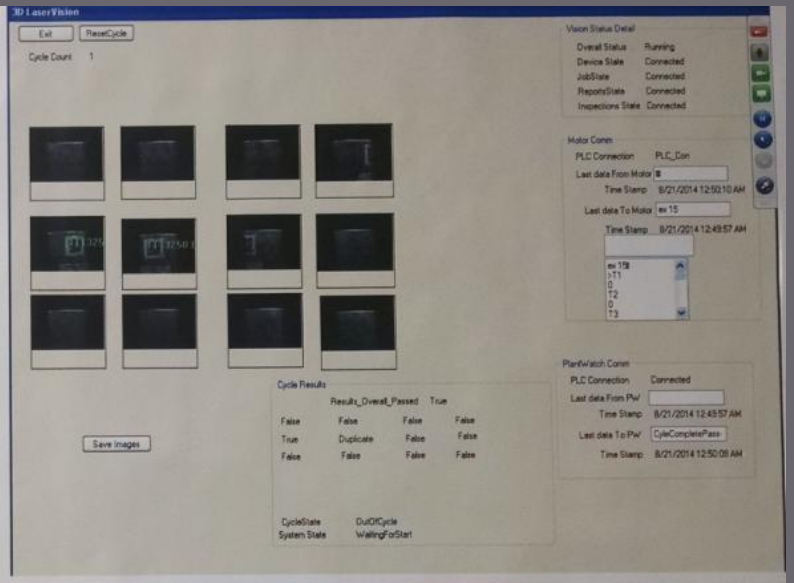
- Plantwatch Used to interface HTE Snap ring system to GM Siemens PLC

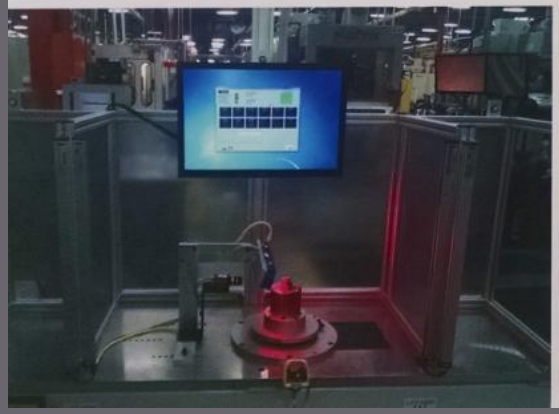


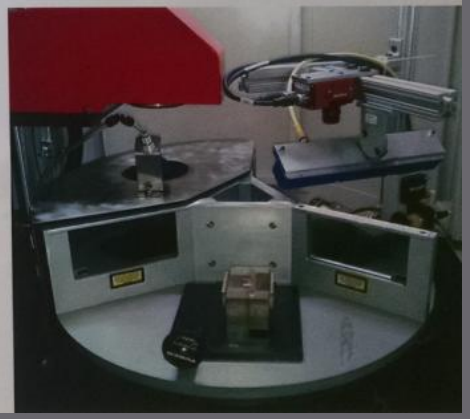


Cummins Fuel

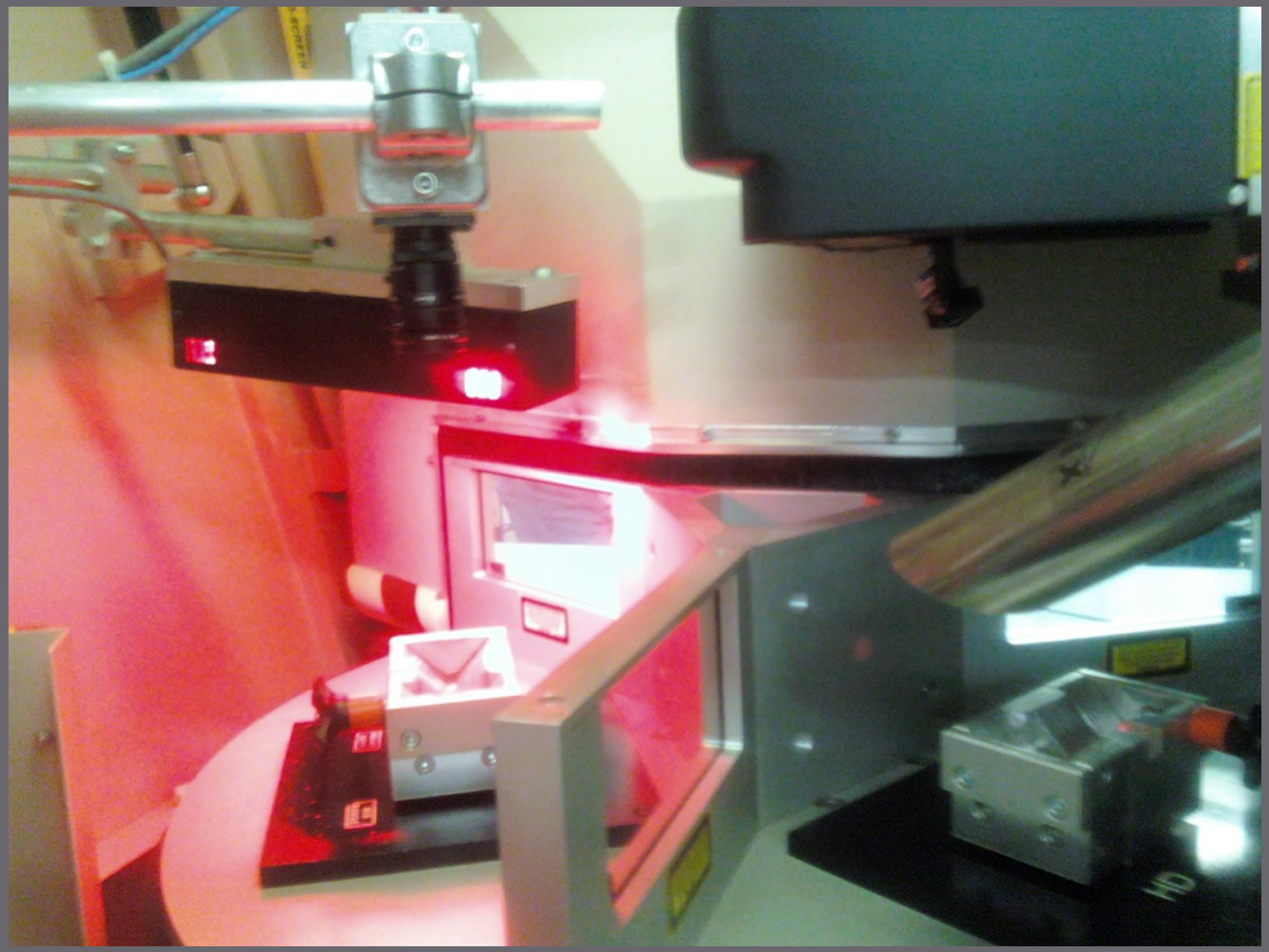




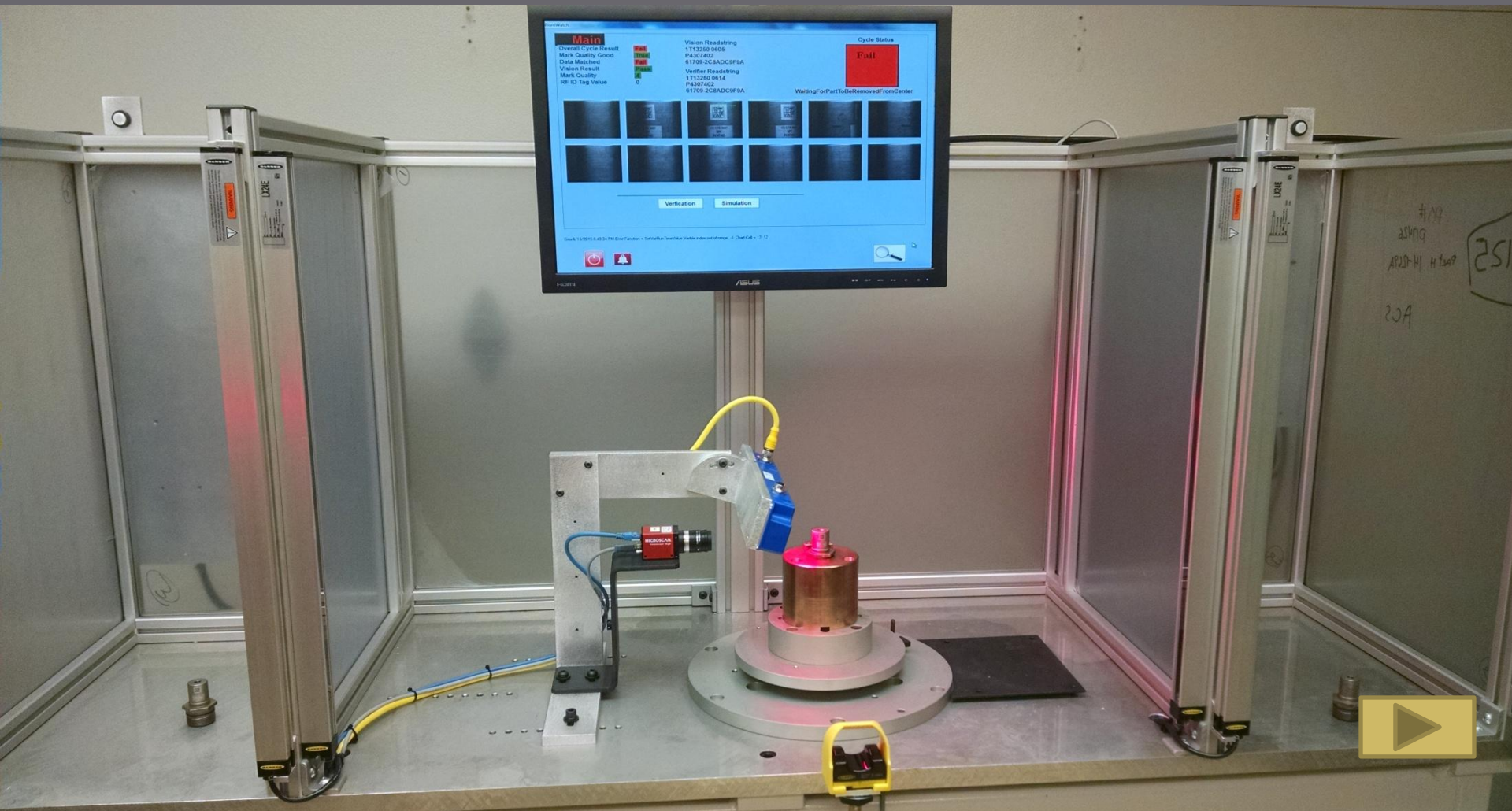




PW gets part type from plc. Checks correct part type by read RF id tag on pallet. Nests are unique to part type. Sends file to laser; triggers laser; mark complete; rotates turntable; fires camera to verify quality; sends results back to PW



B station camera inspects for only one data matrix and compares to A station to confirm verified to “C” grade or better . Confirms unique serial #. Controls light curtains and indicator lights to direct operator motions. Left side is good parts, right side are bad. Stops station until light curtains are broken in correct sequence. Data stored with time date stamp as CSV and to SQL



TSM CORPORATION

Plantwatch
Industrial Automation Software

A FULL-SERVICE MANUFACTURER

TSM is a full-service manufacturer of custom components for automotive powertrain, driveline, and chassis applications.

Plantwatch provides GM required traceability from Tier 1

Plantwatch keeps a collection of data for each part from the moment it is marked.

Before a part is worked on a camera reads it's unique ID to the PLC who then asks Plantwatch if this is a good part that should be worked on at this cell.

Plantwatch checks its data and tells the PLC if it is OK to proceed with that part.

Plantwatch then collects all of the data from the PLC as it processes the part.

One Plantwatch manages 11 PLCs with a total of 14 cells

System

TSM machines and assembles primarily automotive parts, in this case aluminum castings. Once machined they begin the assembly process by having a 2D bar code , Data Matrix etched into the part. The marking machine was supplied by HTE and marks 5 different parts.

Marking Machine

TSM 2

Laser marker

Verification camera

Plantwatch

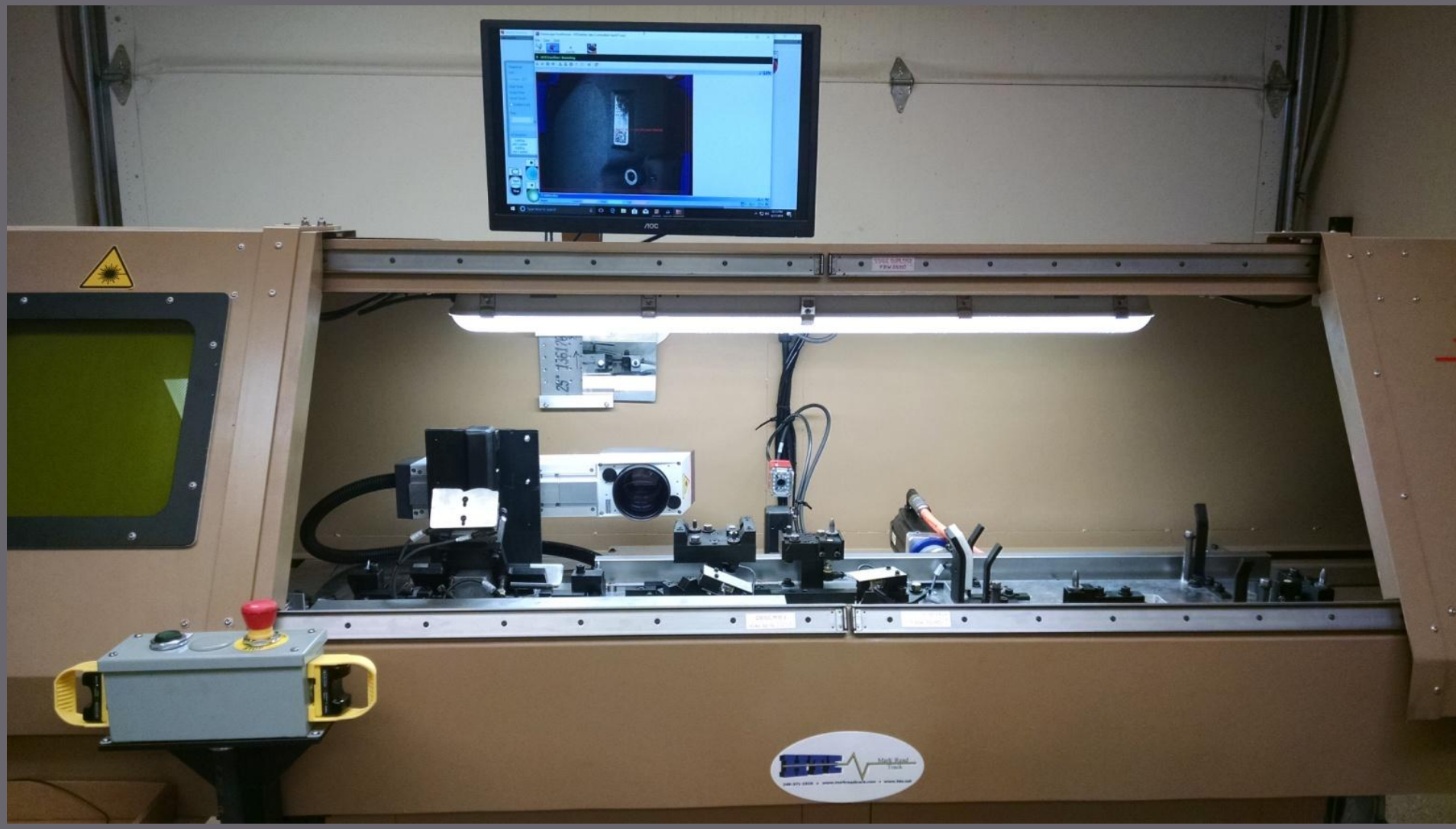
12 downstream camera PW stations

reports

TSM 3

- Laser marker births the part
- Downstream readers id the part and attach the process variables.
- Plantwatch confirms previous process steps

TSM 2



After the parts are marked they are checked for good mark quality and decode content. Each part is uniquely identified and the data is associated with the part is logged to Plantwatch. Latter this data will be used to verify that the mark quality was good before any work is done with the part.

The marked parts are then taken to the assembly area where they are processed in one of 4 lines, each line has 3 to 6 cells.

One PC based Plantwatch system error proofs and collects data from the 4 lines during the assembly process.

Data

Cameras - There are about 18 cameras spread out in the 11 cells. Some read the marked castings while others read barcodes on parts being added to the assembly. The cameras communicate over Ethernet IP to the PLC.

Data Points – There are about 250 data points collected thru the cells.

Leak test

- Final Pressure

Torque

- Total degrees
- Peak Torque
- Final Torque

Press

- Peak Pressure
- Final Pressure

Assembly line

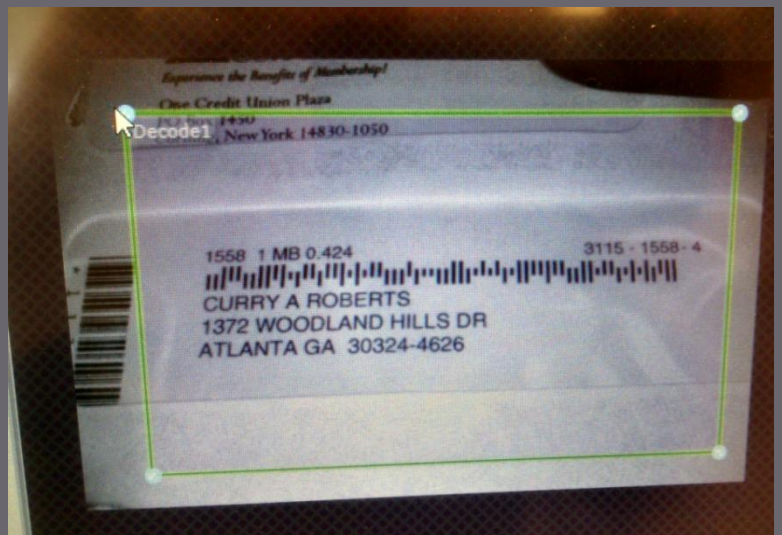
CW castle IDS postal system

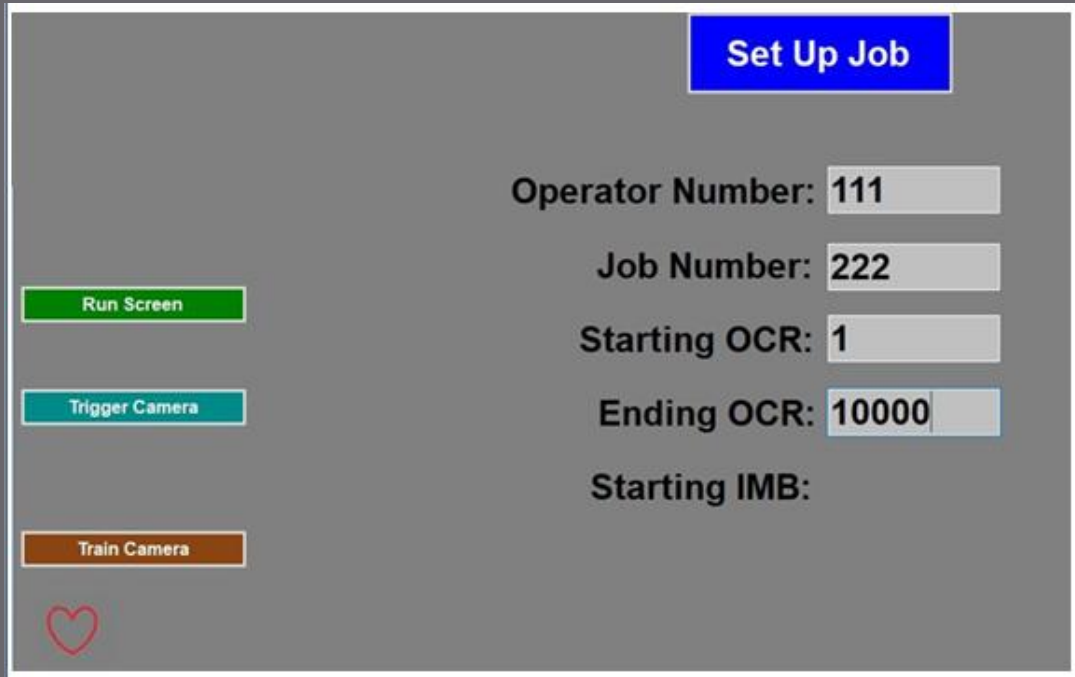
Plantwatch based camera and
data collection /control system

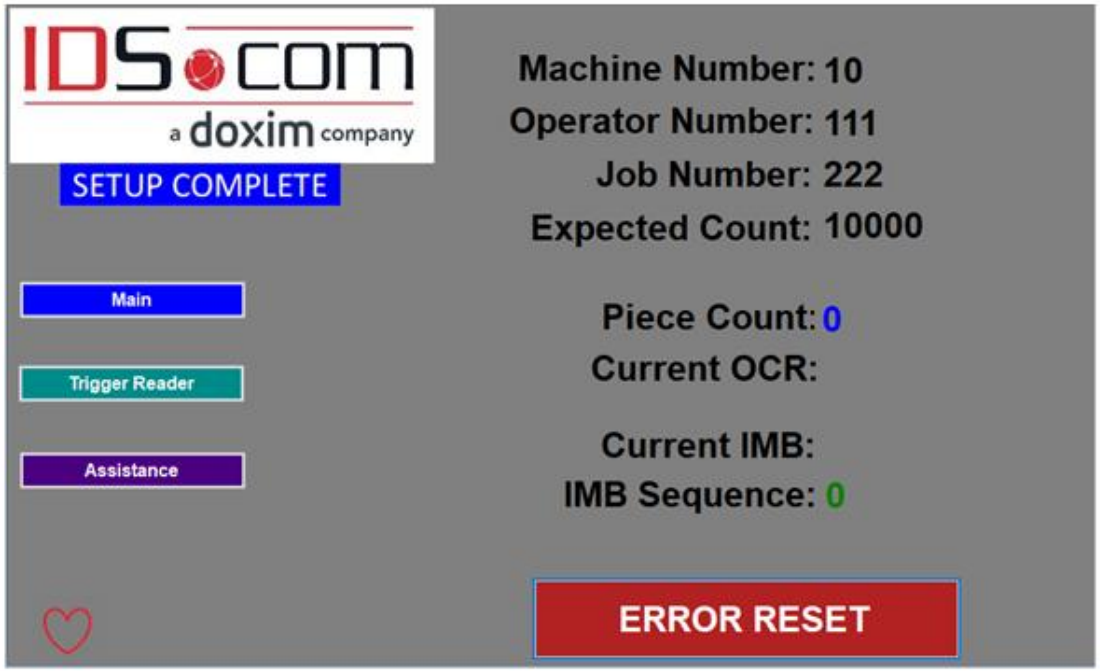
OMB Barcode / Data Matrix/ OCR

High speed insertion/tracking/reporting

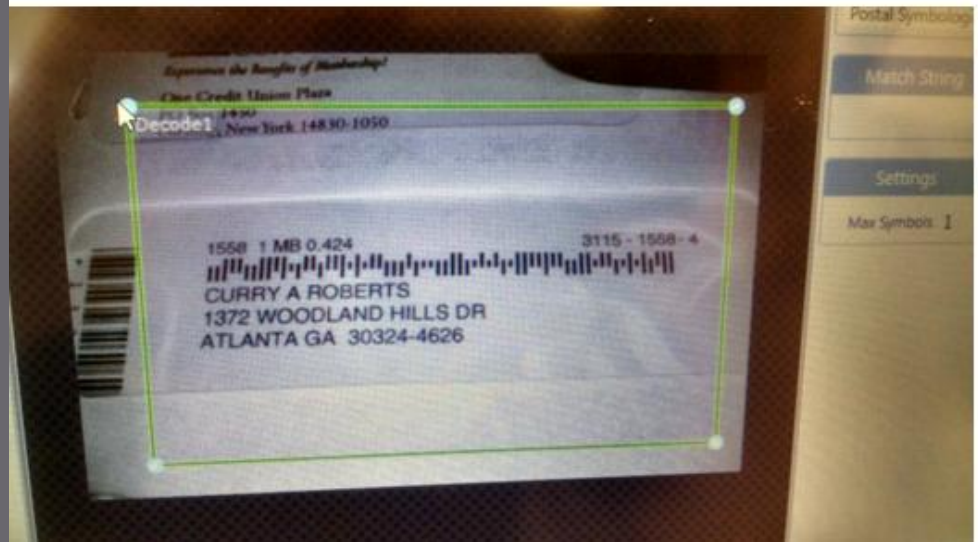
Image logging




Set Up Job
Operator Number: 111
Job Number: 222
Starting OCR: 1
Ending OCR: 10000
Starting IMB:
Run Screen
Trigger Camera
Train Camera


IDS.com
a doxim company
SETUP COMPLETE
Machine Number: 10
Operator Number: 111
Job Number: 222
Expected Count: 10000
Piece Count: 0
Current OCR:
Current IMB:
IMB Sequence: 0
Main
Trigger Reader
Assistance
ERROR RESET

This is a saved image from the computer. Each triggered read results
a saved image with a unique file name for historical look up.



One example of a report. Unlimited reports are configurable.

Production Data.txt

```
Production Data
Machine:1
Operator:11
Exit Count,Read,Time,System,Pages,Read,Process Status

1,00001,10:49:20,FED,3 Pg,00001,Auto
2,00002,10:49:25,FED,1 Pg,00002,Auto
3,00003,10:49:28,FED,2 Pg,00003,Auto
4,00004,10:49:30,FED,1 Pg,00004,Auto
5,00005,10:49:32,FED,4 Pg,00005,Auto
6,00006,10:49:34,FED,3 Pg,00006,Manual
7,00007,10:49:37,FED,1 Pg,00007,Auto
8,00008,10:49:39,FED,2 Pg,00008,Auto
9,00009,10:49:41,FED,1 Pg,00009,Auto
10,00010,10:49:43,FED,4 Pg,00010,Manual
11,00011,10:49:45,FED,3 Pg,00011,Auto
12,00012,10:49:47,FED,2 Pg,00012,Auto
13,00013,10:49:50,FED,1 Pg,00013,Auto
14,00014,10:49:53,FED,3 Pg,00014,Auto
15,00015,10:49:55,FED,2 Pg,00015,Auto

10:52 AM 9/25/2018
```

OP 005 Cell Testing

Data_ ID	Data_Desacripotion	Data Formate	Type	Tag_Name
0001DTSTMP	Date Stamp			VHMES Data
0002Mod_ID	Module ID	VHMnnnn		
0003Cell_ID	Cell ID	Murata Cell S/N		
0004Cell_OCV	Cell OCV			
0005Cell_OCV_LSL	Cell OCV Lower Spec V	3.317		
0006Cell_OCV_USL	Cell OCV Upper Spec V	3.495		
0007Cell_OCV_Status	OCV Pass/Fail			
0008Cell_IR	Cell Internal Res. mOhm			
0009Cell_IR_LSL	Cell Res Lim Lower mOhm	8.4		
0010Cell_IR_USL	Cell Res Lim Upper mOhm	10.6		
0011Cell_IR_Status	IR Pass/Fail			
0012SleeveSlit	Yes/No			
0013Cell_Status	Good/NC			
0014Cell_No	Qty			
0015Cell_Good	Qty			
0016Cell_NC	Qty			
0017Recipe_ID	Recipe Number/ID			
0018ProcessComplete	Yes/No			

Khalid Sheikh
Sr. Manufacturing Engineer

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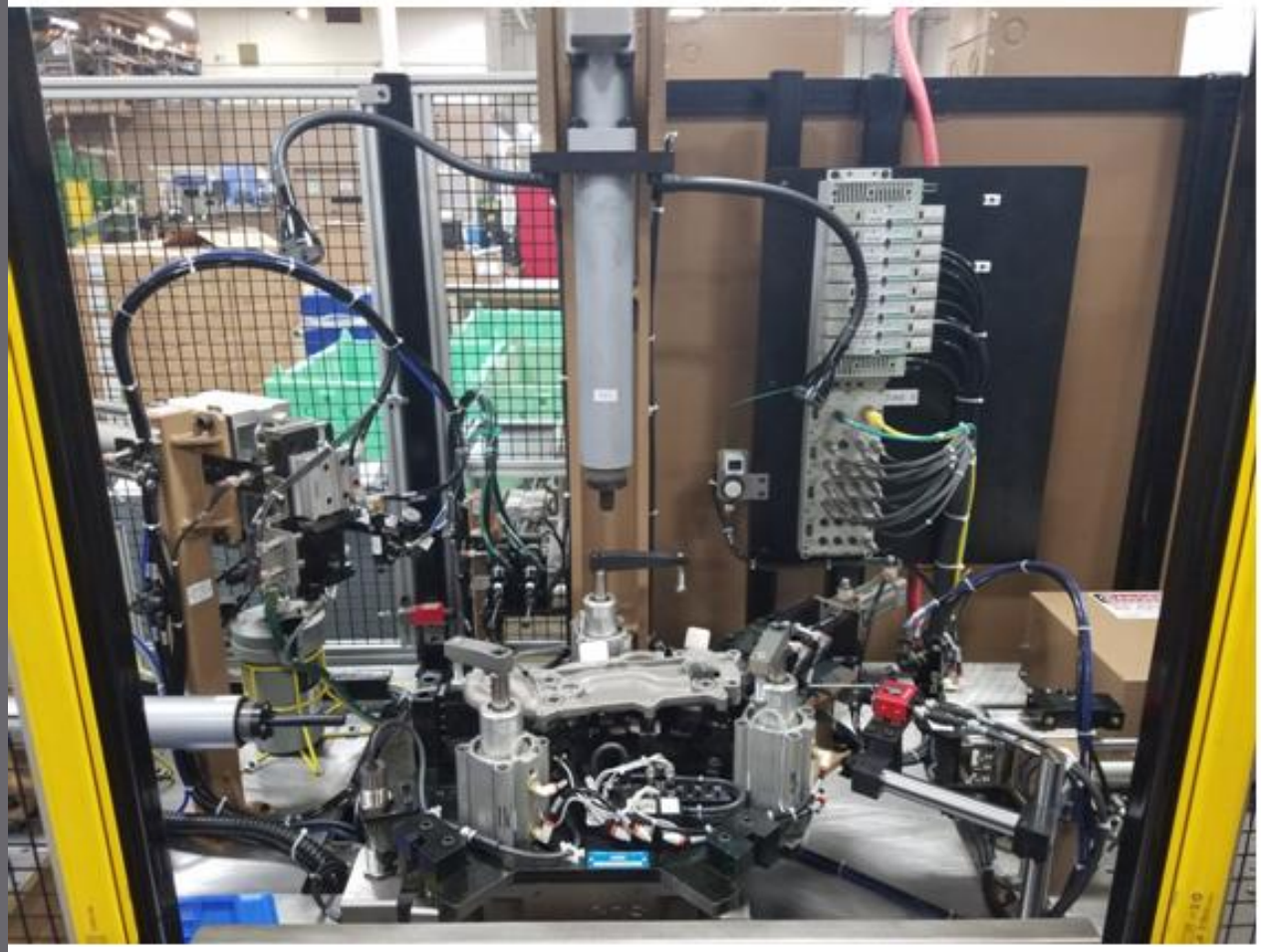
Oil Cooler line with 5 cells

In assembly the marked parts are read by Omron Microscan cameras so the historical data for each part can be checked. If all required tests have not passed, the machine is disabled. As long as all tests passed, the machine will process.



As the machine processes, all of the data from the torque guns and presses is recorded. By the time an assembly is completed there will be in excess of 100 pieces of information associated with the part.