

APPLICATION NOTES

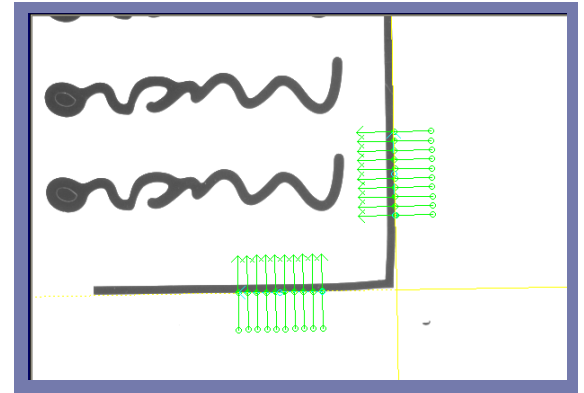
IMPACT Solutions for Automotive Industry

Registration Mark Coordinates Through Ethernet/IP

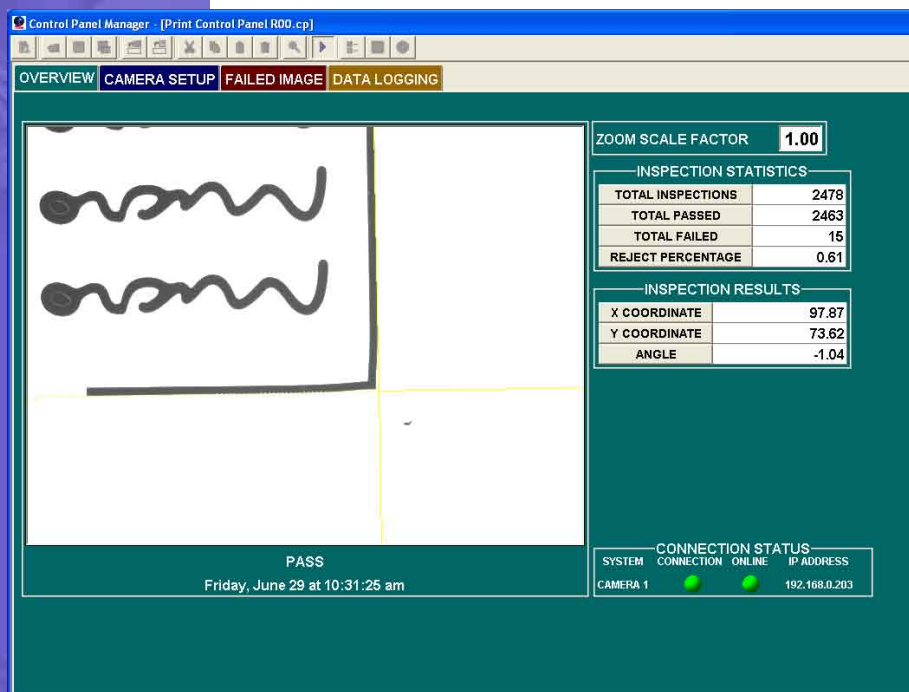
Application Description

This application provides a low cost solution to position a servo controlled adhesive application system. Only one camera is used, with its FOV covering the top left corner of the substrate material. During the inspection process, an image of the registration mark is taken and inspected. The registration mark is inspected using two edge find tools. These tools are looking for the two edges of the registration mark using a series of 10 line segments each. An algorithm then fits a set of lines through the returned point list from each edge find tool and calculates the intersection point. The coordinates of this intersection point are then transformed into the servo controllers coordinate frame and passed to the PLC using Ethernet/IP. An LED strobe light that can have the color wave length adjusted was used to overcome problems with background material and the varying substrate material colors from one part to the other.

A series of line segments are placed on each edge to find the intersecting point



The transformed coordinates are sent to PLC through Ethernet/IP



Control Panel Manager [Print Control Panel R00.cp]

OVERVIEW CAMERA SETUP FAILED IMAGE DATA LOGGING

ZOOM SCALE FACTOR 1.00

INSPECTION STATISTICS	
TOTAL INSPECTIONS	2478
TOTAL PASSED	2463
TOTAL FAILED	15
REJECT PERCENTAGE	0.61

INSPECTION RESULTS	
X COORDINATE	97.87
Y COORDINATE	73.62
ANGLE	-1.04

CONNECTION STATUS

SYSTEM	CONNECTION	ONLINE	IP ADDRESS
CAMERA 1	●	●	192.168.0.203

PASS

Friday, June 29 at 10:31:25 am

Application Highlights

- Determines the X, Y, θ coordinates of a registration mark
- Multiple points are taken along each of the edges to generate two fitted lines so an intersecting point can be calculated using special algorithms
- Angle accuracy up to +/- 0.05 degrees
- An LED strobe light with adjustable wave length to accommodate color variation of the substrate
- Inspection results are transferred to PLC through Ethernet/IP