CORE-VISION REPORT

Comprehensive Optimization & Reliability Evaluation for Vision Systems

Customer Name

Plant 5, Indianapolis
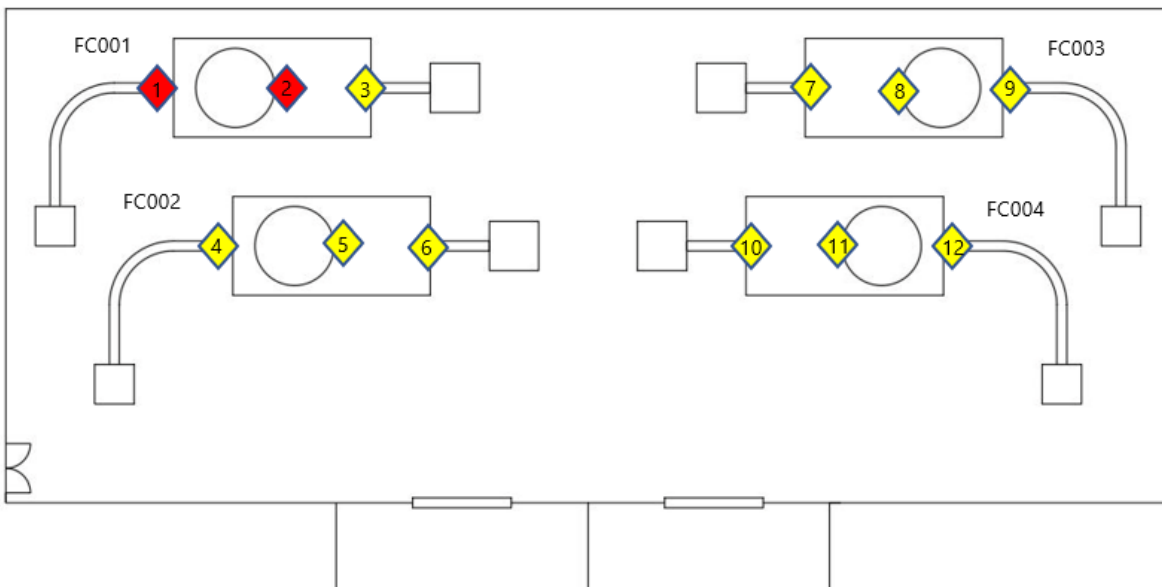
ACTEMIUM

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INTRODUCTION

OVERVIEW

The **Actemium CORE-VISION REPORT** is designed to provide our customers with **a comprehensive review** of their installed base of machine vision systems, from **cameras, barcode readers, to 3D and profiling systems**. Identifying all systems on the plant floor, each systems' intended scope of function, confirmation that this **scope of function** is being delivered properly by each system. If any systems are not delivering their scope of function, we will guide you on what is required to **bring each system into compliance**. We will also identify any out-of-date hardware that poses a replacement obstacle. Any systems that are identified as **mission critical**, defined as needing same day replacement in the event of a system failure, will be identified, and confirmed with a **replacement plan** and **replacement stock.**

Actemium provides our customers with a **maintenance plan** to periodically review the systems for any changes and ensures all systems are in a healthy state of production.

LAYOUT OF SYSTEM

COMPONENTS AND SUBSYSTEMS

◇ In Compliance   ◆ Out of Compliance or At Risk

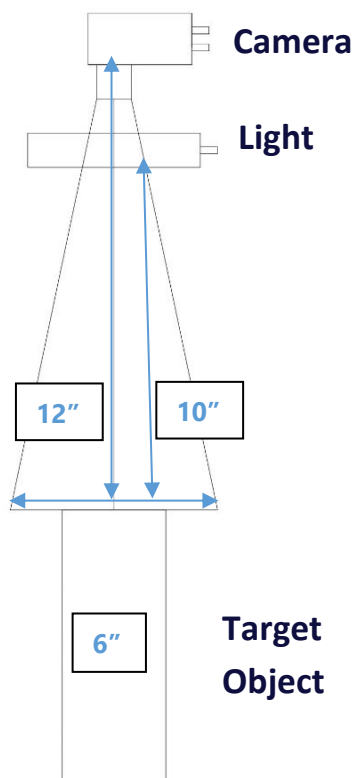| **Fill Cell 001**	**Fill Cell 003**
- Camera 1 – Pre-fill Empty Check - Camera 2 – Crimp Quality Check - Camera 3 – Cap Quality Check	- Camera 7 – Pre-fill Empty Check - Camera 8 – Crimp Quality Check - Camera 9 – Cap Quality Check
Fill Cell 002	**Fill Cell 004**
- Camera 4 – Pre-fill Empty Check - Camera 5 – Crimp Quality Check - Camera 6 – Cap Quality Check	- Camera 10 – Pre-fill Empty Check - Camera 11 – Crimp Quality Check - Camera 12 – Cap Quality Check

FILLING CELL 01

CAMERA 1

BOM

Part Number	Description	Product Status
IS7600-11	In-Sight 7600/Monochrome/VGA/PatMax	Discontinued
CCB-PWRIO-15	Power and I/O Cable, M12-12 (15M Length)	Active
CCB-84901-2001-15	Cognex X-Coded M12 Ethernet Cable (15M Length)	Active
LEC-59871	Edmunds 25mm Techspec 1/1.8" Fixed Focal Length	Active
IVSL-5PM12-15	5 PIN 15 METER LIGHT CABLE	Active
ICELRC-100SW	Effilux ring lights 100MM	Active

PHYSICAL SETUP

Camera

Light

12" 10"

6" **Target Object**

- Camera is mounted directly above the part, with a working distance of 12", looking directly through the ring light.
- Distance of the light from the camera is 10.0" directly above the camera, on axis with the camera and part.
- The Field of View is 6.0"

SCOPE OF FUNCTION

- **Definition of Purpose**
    - Confirm can is present
    - Confirm the can is clear of any foreign objects
- **Tool Solution**
    - Uses Find Circle tool to fixture on the empty can.
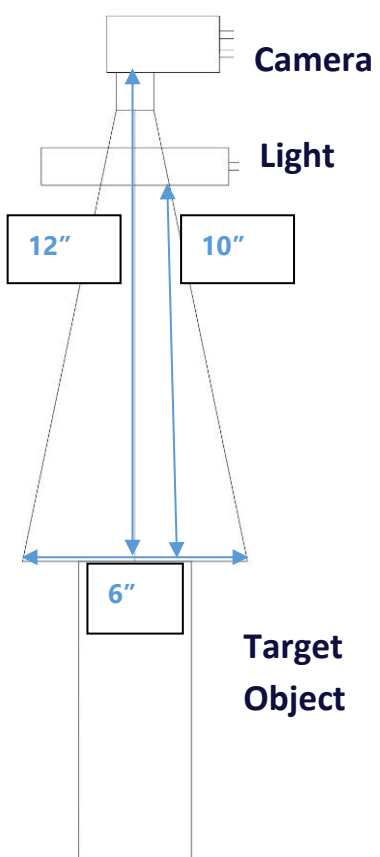   - Blob tool is used to confirm the can is empty.

STATUS OF FUNCTIONALITY

- This system is compliant with its defined scope of functionality.
- This system is running firmware revision level 6.01.01.
- This system has a **DISCONTINUED** product that is **UNAVAILABLE** for order as a replacement.
- This system has a redundant cell, so this system had been deemed as non-critical to operations.
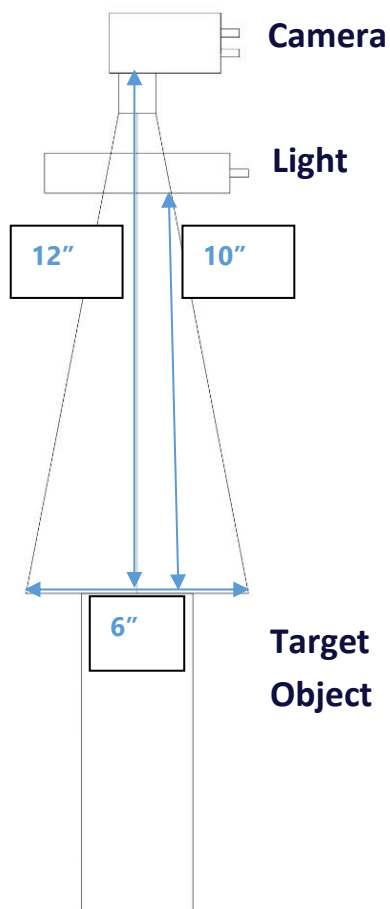
CAMERA 2

BOM

Part Number	Description	Product Status
IS7802-363-50	In-Sight 7800/Monochrome/VGA/PatMax	Active
CCB-PWRIO-15	Power and I/O Cable, M12-12 (15M Length)	Active
CCB-84901-2001-15	Cognex X-Coded M12 Ethernet Cable (15M Length)	Active
LEC-59871	Edmunds 25mm Techspec 1/1.8" Fixed Focal Length	Active
IVSL-5PM12-15	5 PIN 15 METER LIGHT CABLE	Active
ICELRC-100SW	Effilux ring lights 100MM	Active

PHYSICAL SETUP

Camera

Light

12"   10"

6"

Target Object

- Camera is mounted directly above the part, with a working distance of 12", looking directly through the ring light.
- Distance of the light from the camera is 10.0" directly above the camera, on axis with the camera and part.
- The Field of View is 6.0"

SCOPE OF FUNCTION

- **Definition of Purpose**
    - Confirm presence of can
    - Inspect the crimp ring to confirm there aren't any defects
        - Any dents larger than 1mm
        - Material failure to fully roll over by 1mm
    - Confirm the presence of the nozzle
- **Tool Solution**
    - Uses Find Circle tool to fixture on the filled can.
    - Find Edge tool is used with an annulus ROI to inspect for defects on the crimp.
        - If any edges are detected, it is a failure.
    - PatMax tool is used to confirm the presence of the nozzle.
        - If nozzle pattern isn't detected, it is a failure.

STATUS OF FUNCTIONALITY

- This system is **NOT** compliant with its defined scope of functionality.
    - Find Circle tool is finding incorrect edges, causing the Find Edge tool to fail good parts.
- This system is running firmware revision level 6.01.01.
- This system is a current system that is available for order as a replacement.
- This system has a redundant cell, so this system had been deemed as non-critical to operations.

CAMERA 3

BOM

Part Number	Description	Product Status
IS7802-363-50	In-Sight 7800/Monochrome/VGA/PatMax	Active
CCB-PWRIO-15	Power and I/O Cable, M12-12 (15M Length)	Active
CCB-84901-2001-15	Cognex X-Coded M12 Ethernet Cable (15M Length)	Active
LEC-59871	Edmunds 25mm Techspec 1/1.8" Fixed Focal Length	Active
IVSL-5PM12-15	5 PIN 15 METER LIGHT CABLE	Active
ICELRC-100SW	Effilux ring lights 100MM	Active

PHYSICAL SETUP

Camera

Light

12"   10"

6"

Target Object

- Camera is mounted directly above the part, with a working distance of 12", looking directly through the ring light.
- Distance of the light from the camera is 10.0" directly above the camera, on axis with the camera and part.
- The Field of View is 6.0"

SCOPE OF FUNCTION

- **<u>Definition of Purpose</u>**
  - o Confirm the presence of the can
  - o Confirm the presence of the cap
- **<u>Tool Solution</u>**
- Uses Find Circle tool to fixture on the filled can.
- PatMax tool is used to confirm the presence of the cap.

STATUS OF FUNCTIONALITY

- This system is compliant with its defined scope of functionality.
- This system is running firmware revision level 6.01.01.
- This system is a current system that is available for order as a replacement.
- This system has a redundant cell, so this system had been deemed as non-critical to operations.

SUMMARY

TOTAL SYSTEMS

- 12 vision systems on Plant 5 production floor.

SYSTEMS OUT OF COMPLIANCE

- 1 vision system out of compliance.
- 1 vision system is at risk

RISKS IDENTIFIED AND RECOMMENDED ACTIONS

Risk	Identification of Risks	Recommended Corrective Actions
1	Fill Cell 001, Camera 1 is a discontinued product without an available direct replacement.	**1A:** We recommend that you have an upgrade plan in place.
2	Fill Cell 001, Camera 2 is out of compliance. • It appears the stability of the product during presentation to the vision system has loosened. • The fixture tool is not reliably finding the correct circle to fixture on. • This causes the region of interest of the Edge Detection tool to be out of position. • Due to the incorrect location of the ROI, the Edge Detection tool is erroring out. • The result of this is the rejection of good parts. • This is raising the following costs: o Material o Production rate o Labor	**2A:** It is our recommendation that the camera has the fixturing programming updated with a more appropriate technique, that would be able to handle the wear of the conveyance equipment. **2B:** You could replace the conveyance system to bring the location of the part within original scope. This would likely be the more expensive option. You will also likely need to do this, eventually to all the cells.
3	While Cells 2 through 4 are currently in compliance, similar wear to the location fixtures will eventually suffer the same failures as Cell 1.	**3A:** It is our recommendation that all cameras have their fixturing programming be updated with a more appropriate technique, that would be able to handle the wear of the conveyance equipment.

RISK 2 EVALUATION

Here you see the perimeter of the crip is found.

You can see the tools are all functioning properly.
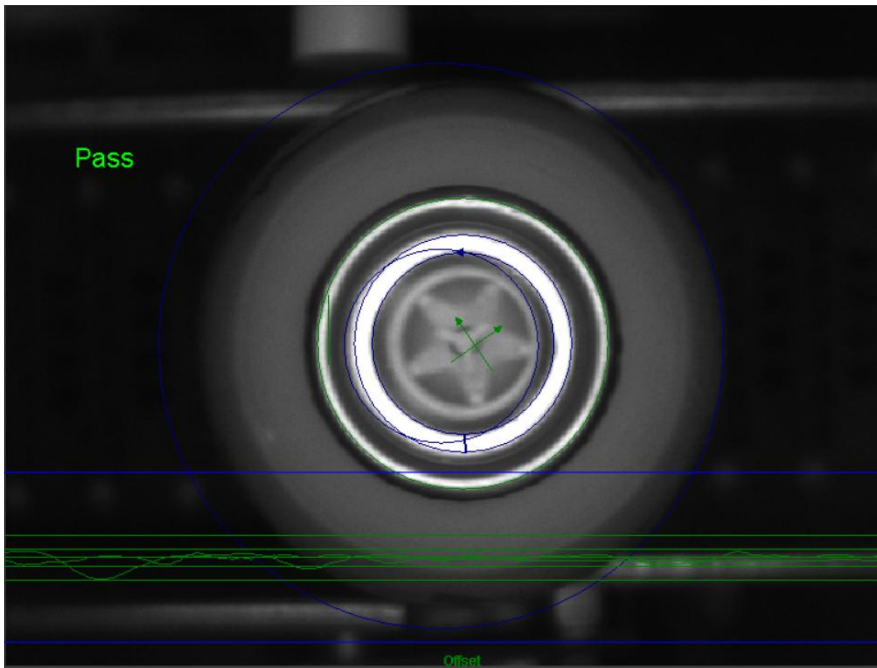
	A	B	C	D	E	F	G	H
0	Image							
1	Binarize Filter							
2	Image							
3								
4	Locate Edge Of Outer Circle Location	Row0	Col0	Row1	Col1	Score		
5	Edges	210.038	233.602	260.038	233.602	-31.268		
6	Pass							
7								
8	Locate Outer Circle							
9		CentRow	CentCol	Radius	Score			
10	Edges	245.663	330.969	106.370	-62.354			
11								
12								
13	Locate Outer Crimp Circle							
14		CentRow	CentCol	Radius	Score			
15	Edges	246.179	330.396	66.845	58.130			
16								
17	Edge Detect							
18		Row0	Col0	Row1	Col1	Score	Found	
19	Edges	#ERR	#ERR	#ERR	#ERR	0.000	0.000	
20								
21	Plot Defects Points							
22	#ERR							
23	#ERR							
24	#ERR	Invert Pattern Found		0.000				
25								
26	Find Nozzle Pattern							
27		Index	Row	Col	Angle	Scale	Score	Found

Here you see the perimeter of the crimp was not found properly

The Edge Detection tool is errored out due to the incorrect positioning of its ROI.