



Complete Automation Solutions, Inc.

An Engineered Solutions Provider

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CAS Carton Inspection System *The Guardian* your last line of defense

CAS is an engineered solutions provider that has expertise in automation and product handling systems. CAS provides robust engineered solutions to meet your automation needs from small projects to complete turnkey systems.

We are pleased to announce our **patent pending** Carton Inspection System - **The Guardian**. The Guardian is the last line of defense in insuring that the correct carton and its related carton quality are sent to your customer. The CAS Inspection System is designed to fit within an existing conveyor system to maximize floor space or on a turnkey conveyor with integral rejection built by CAS. The complete system is designed for a wash down environment meeting NEMA 4X standards.

General Description

The CAS Inspection System uses a camera to inspect the carton graphics, two opposing laser sensors for measuring the carton dimensions, and two sensors to detect the presence of product within the carton. The overall goal of the vision sensor is to compare the current carton graphics versus the stored carton graphics (the stored camera image) and send a Pass or Fail signal to the PLC upon determination. Simultaneously, the laser measurement is used to determine whether the carton length, width, and side deviation is acceptable and at the same time, the product detection sensors evaluate the status of product within the sealed carton.



The Pass or Fail state from one of the three inspection points, determines whether the PLC will “mark” the carton for rejection from the system. Once marked for rejection, the position based control system tracks the carton, using a high-resolution feedback encoder, until it reaches the precise position required for reject. In addition, the operator can select the desired carton parameters from the stored 150 recipes by using the Panel View Operator Interface. Downloading a new recipe causes the system to automatically “setup” the controls with the desired parameters to reject the incorrect cartons. Also, the PV displays the statistics of good cartons, rejected cartons, total cartons, conveyor rate, and carton rate.

| Production Stats | | X | |
|------------------|-----------|-----------------|-----|
| Current Shift: | | Previous Shift: | |
| Vision Rejects: | 0 | Vision Rejects: | 5 |
| Laser Rejects: | 0 | Laser Rejects: | 15 |
| Empty Rejects: | 0 | Empty Rejects: | 10 |
| Good Cartons: | 1 | Good Cartons: | 170 |
| Total Cartons: | 1 | Total Cartons: | 200 |
| Good %: | 100 | Good %: | 85 |
| ADMIN | Recipe: 1 | 12 spec pep rb | |



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The CAS Carton Inspection System inspects the following characteristics of the cartons –

Graphic Detection:

The system uses an overhead mounted Vision Sensor to detect the correct graphics on the carton. The Camera is enclosed in a NEMA 4X enclosure.

Side Flap Detection:

The side flap inspection is detected via two opposing laser sensors with analog output as to the distance of the carton from the sensor. Each Laser sensor sends an analog signal to the computer as to the “profile” of the cartons’ side where the control system analyzes the data to determine the width of the carton, the length, and the deviation of each side. The sensors are IP67 and Class II Type.



Empty Carton Detection:

The empty carton detection uses two sensors to detect the presence of product within the formed carton.

Position Based Control System

Once the Guardian determines the carton to be out of spec, an output from the PLC is given to reject the carton at the desired position based on the conveyor-mounted encoder. The Inspection system uses the encoder to monitor precisely when to turn on and off the reject, carton length, and other logic control points. It is important to note that by using a high-speed position based control system the speed of the conveyor becomes less of an issue because all logic is based on the position of the encoder. Thus, the events are controlled at the exact moment required.

CAS Documentation Supplied on CD in Electronic Format

- Electrical Drawings in AutoCAD format
- Vendor Documentation in electronic format
- Camera setup software
- PLC programs
- Panel View programs
- CAS System Manual in PDF format



Typical System Conceptual Drawing

(Note: Each Camera Installation must be custom designed to properly mount into the existing system)

