# GigE Vision Camera

Introduction

AXP series has an 8th Generation Intel Core multi-core processor, is equipped with 32GB DDR4 memory and Windows 10 IoT operating system, with e-PoE400/e-PoE200, e-USB400 corresponds to Vision Cameras with different interfaces, and can provide image capture, processing, Functions such as storage and display, together with different motion control cards and various e-9K/I-9K/I-97K I/O modules, can simplify the development of various machine vision applications to quickly set up the vision system required for work. The vision system plays an important and key role in factory automation. It can be used to guide, inspect and track the production process of product manufacturing, assembly and packaging. Using functions such as visual image capture and image data analysis, it can be adjusted in time and streamlined optimization procedures. Tightly and seamlessly integrate or build into automated processes and equipment, greatly improving productivity and accuracy.

PoE Camera System architecture diagram
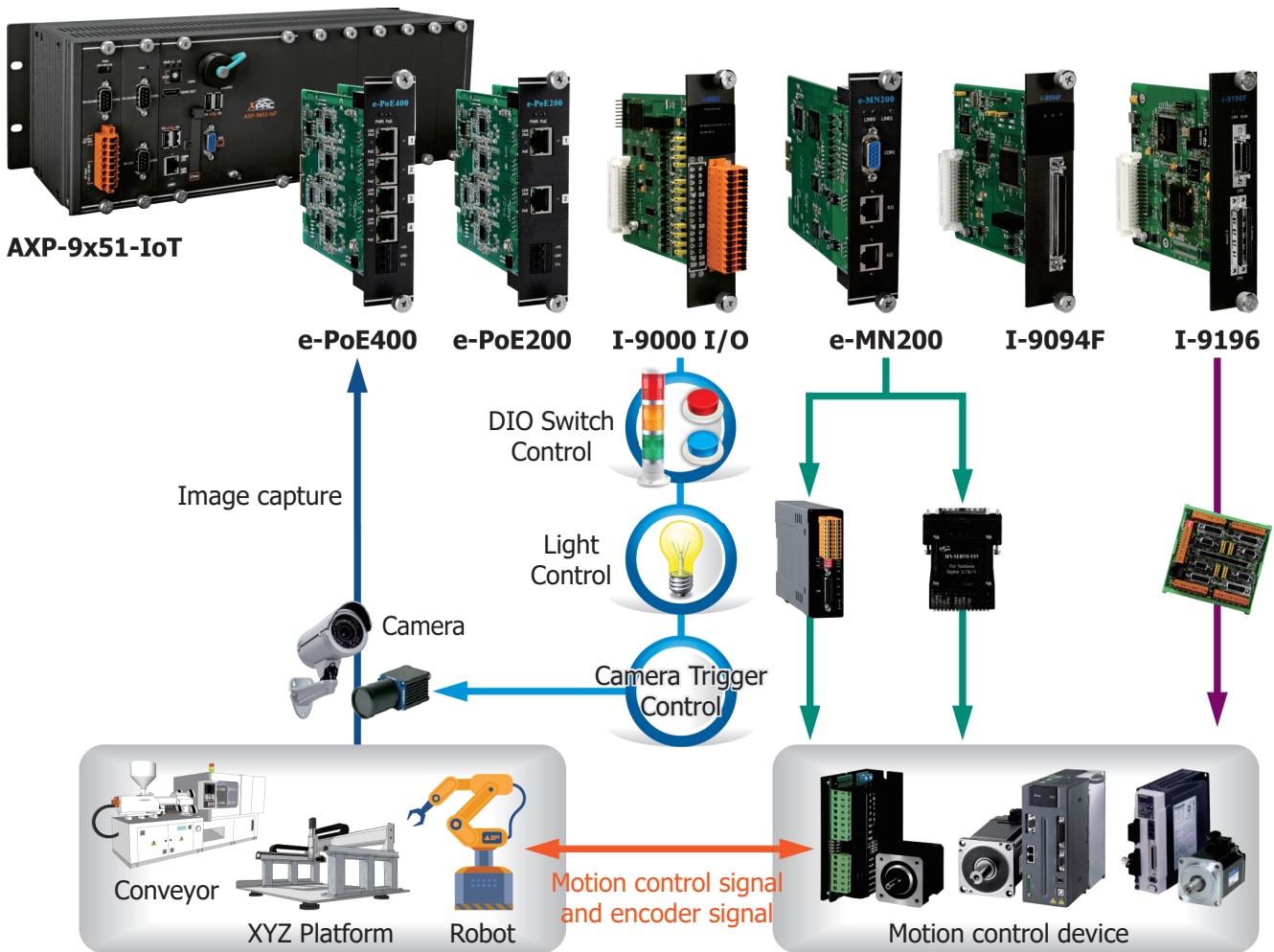
AXP-9251-IoT/AXP-9651-IOT
e-PoE400 with Max. 4 PoE camera
e-PoE200 with Max. 2 PoE camera
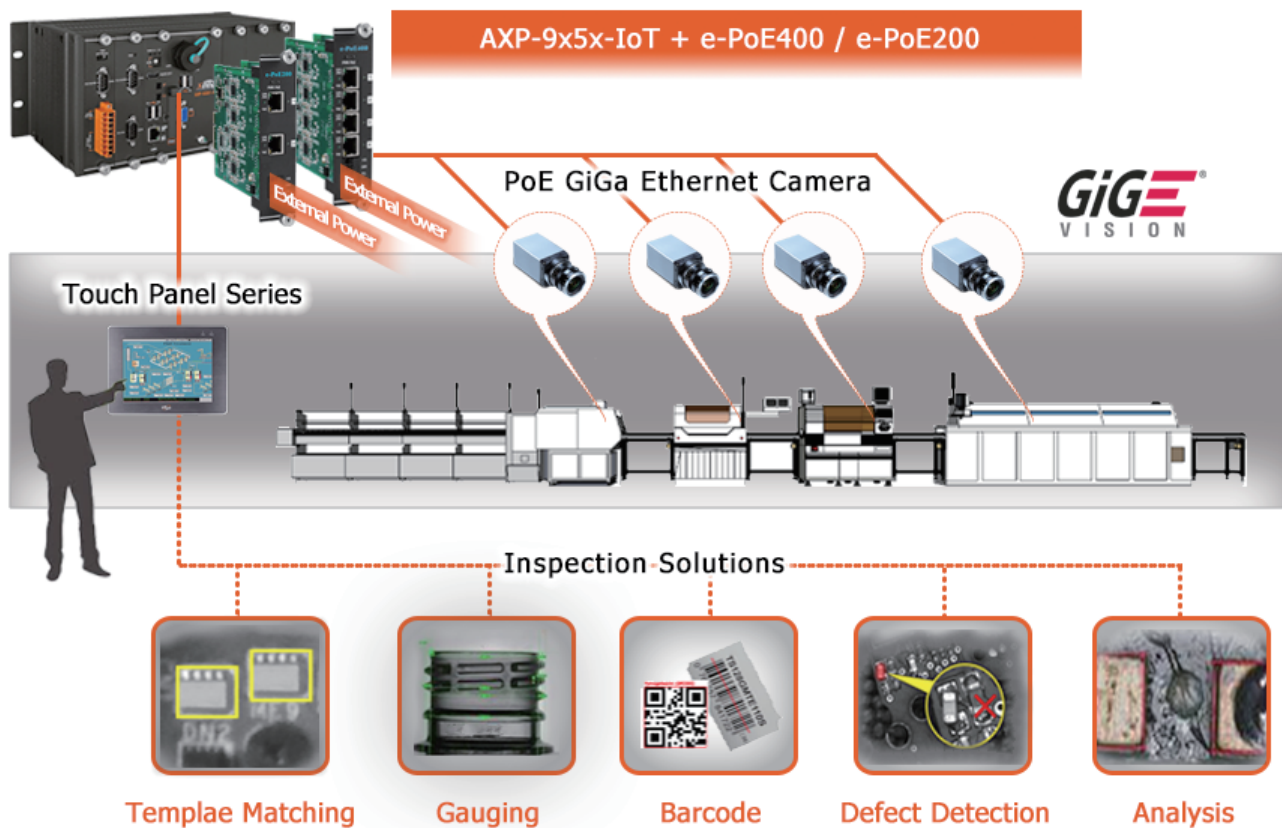
Vision + Motion control solutions

AXP-9x5x-IoT provides multiple motion control modules (e-MN200/i-9094/i-9196) with image capture module, which can be applied to the field of Automated Optical Inspection (AOI), covering industrial automation Optical inspection equipment for LCD/TFT, transistor and PCB industrial processes, as well as in the IC and general electronics industry, machine tools/automation machinery, motor/electronics industry, metal and steel industry, food processing/packaging industry, textile leather.

AXP-9x51-IoT

e-PoE400   e-PoE200   I-9000 I/O   e-MN200   I-9094F   I-9196

Image capture

DIO Switch Control

Light Control

Camera

Camera Trigger Control

Conveyor

XYZ Platform   Robot

Motion control signal and encoder signal

Motion control device

AXP controller with I-9093 can generate a periodic trigger signal through its encoder and position comparison sampling circuit. This high-speed periodic trigger can control area and line scan cameras and other industrial inspection applications that require continuous high-speed trigger signals. The image sampling of the optical inspection scanning system triggers sampling at very high speed at regular intervals. The location comparison function can be activated by software or by dedicated DI.

AXP-9000 with I-9093+I-9041+ e-PoE200 + PoE GigE Vision Camera
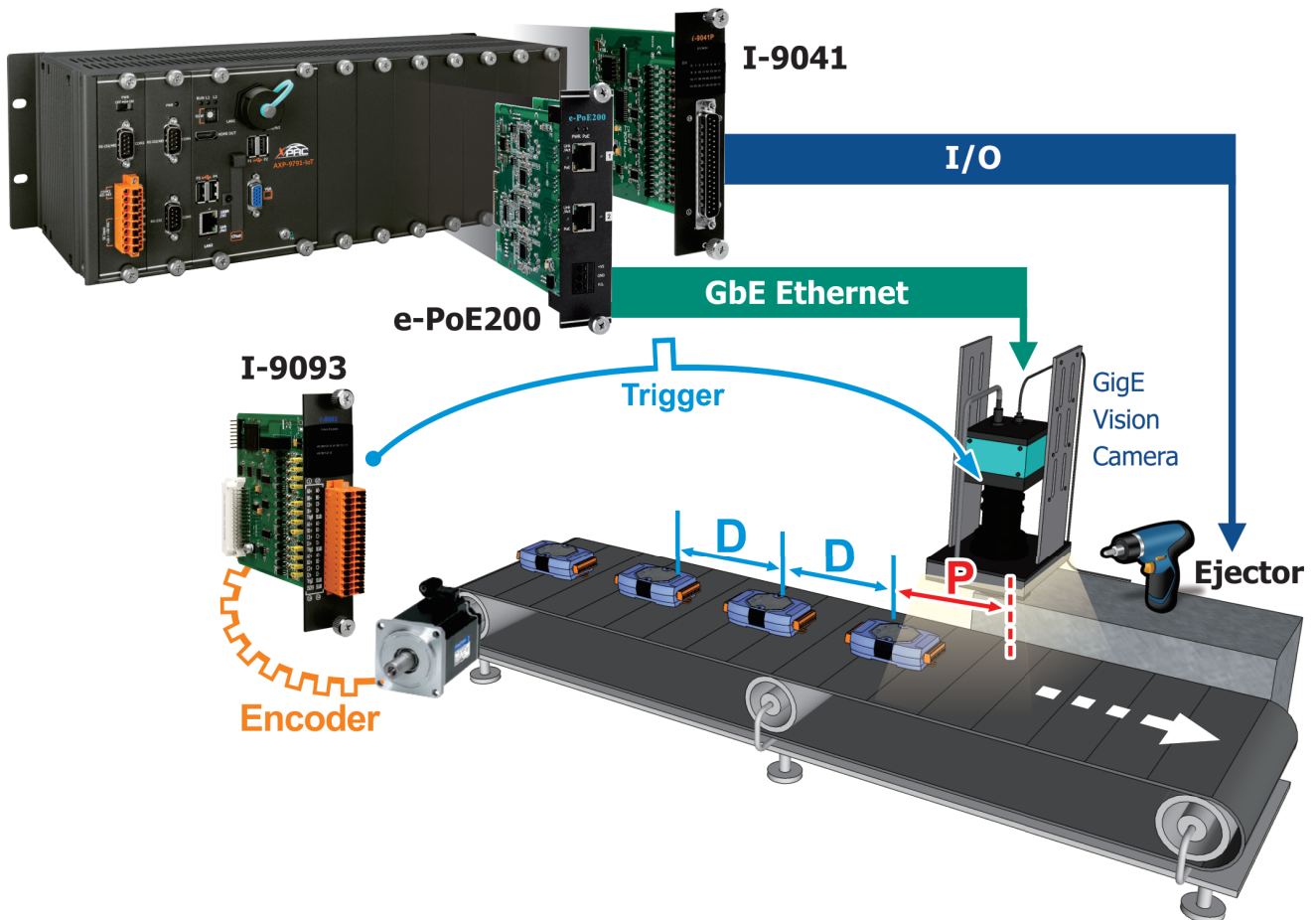
Operation of Multiple Cameras in a Network

4 GigE Vision 2.0 Cameras with PTP, IEEE1588 connect to 4 GbE LAN ports of e-PoE400

- TRIGGER-OVER-ETHERNET WITH ACTION COMMAND
- SCHEDULED ACTION COMMAND
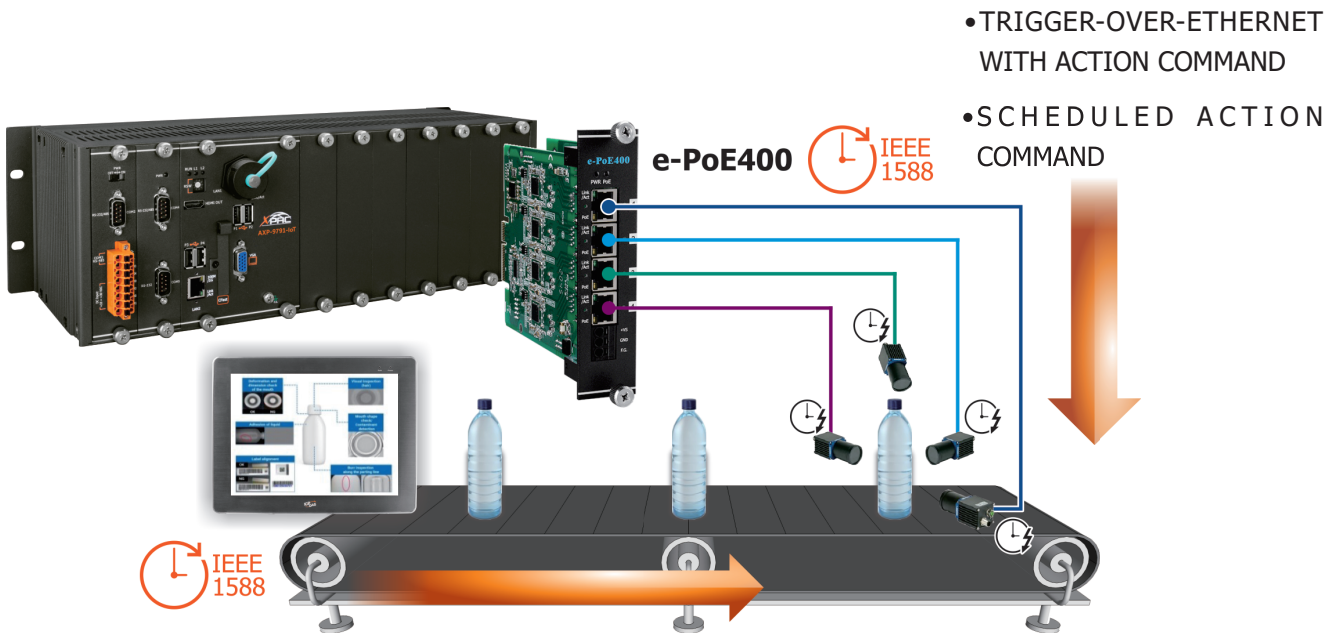
Computer vision inspection of the Shape Size of bottles and cans

The bottles are transported on the conveyor belt at a uniform speed. They will go through a series of four GigE Vision cameras installed for inspection. Each camera acquires an image of the bottle at the same precise time (when the bottle passes under the camera's position). Since each camera image will subsequently be merged into one image, the camera must acquire the image at the same time.

Originally, in order to achieve synchronization or real-time behavior, image acquisition of multiple cameras usually needs to be triggered by a digital signal on the camera's dedicated I/O port. In this hardware configuration, each camera must be connected with an additional cable equipped with a suitable plug. This not only complicates the installation, but also costs more.

GigE Vision 2.0 implements a new camera function for the Precision Time Protocol (PTP, IEEE 1588): all cameras in the network can synchronize and work with the same precise time. Simultaneous and/or real-time operation of the camera provides a simple alternative without the need for additional wiring.