LISTEN.
THINK.
SOLVE.SM

Rockwell Automation

Diaper Machine & Sanitary Machine

Jack Lee
AP/China/GOTC

Products

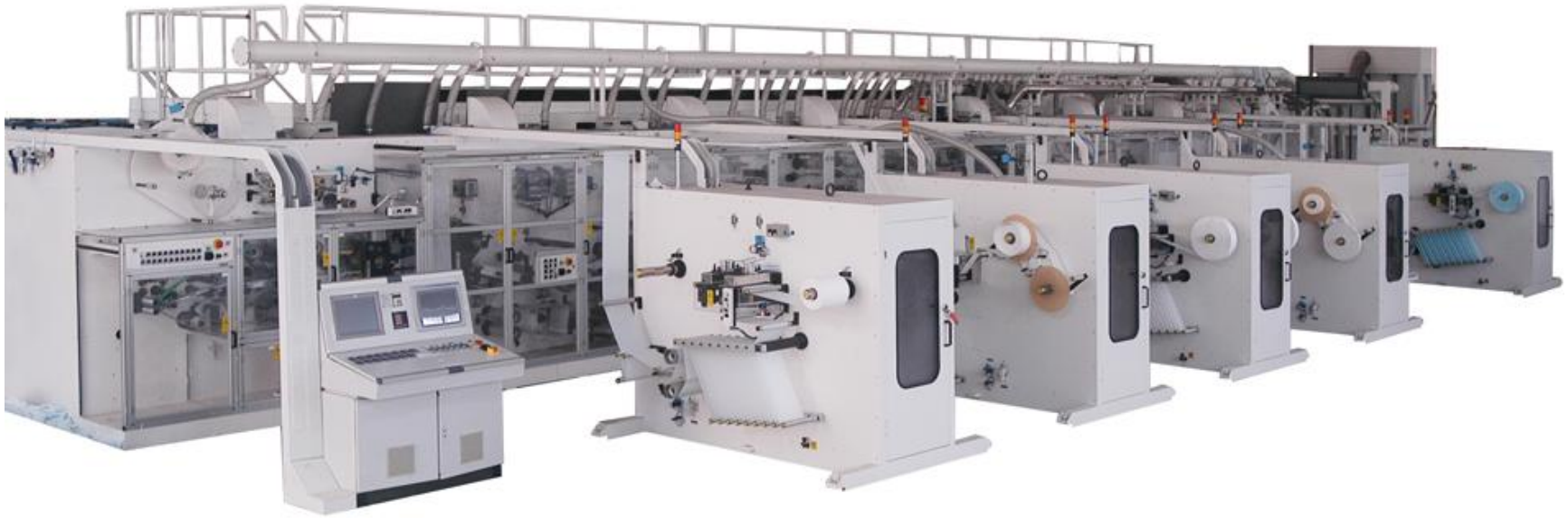
- Adult Diaper
- Baby Diaper (L,M,S)
- Multi-functional sanitary napkin with easy-opening package
- Panty shields with easy-opening package
- Ultra-thin panty shields cross direction with easy-opening package
- Fluff and ultra-thin sanitary napkin with easy-opening package

Sanitary Napkin Production Machines

Diaper Production Machines

Overview of Machine

- Unwind (SM, IM)
- Web Guiding (BST, E+L,FIFE, K-Like…)
- Melter (Nordson, Dynatec…)
- Multi-Axes run Synchronously (Kinetix, SERCOS, CIP-Motion)
- Vision System (COGNEX, KEYENCE…)



Overview of Machine

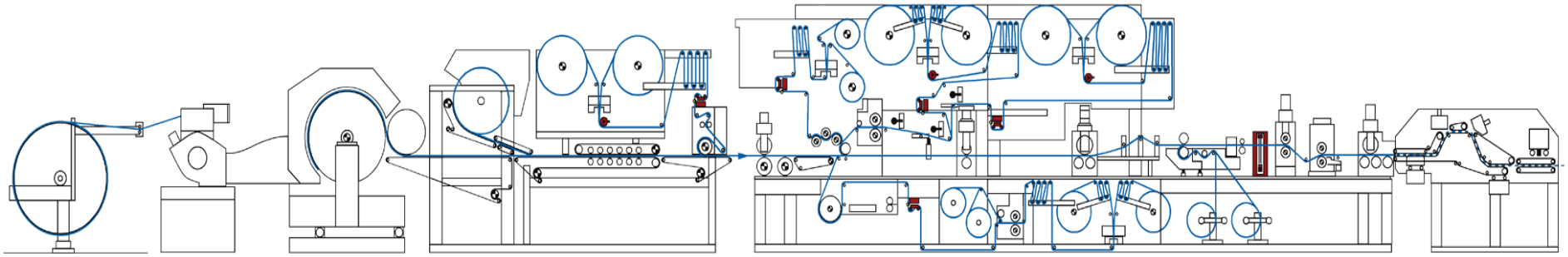




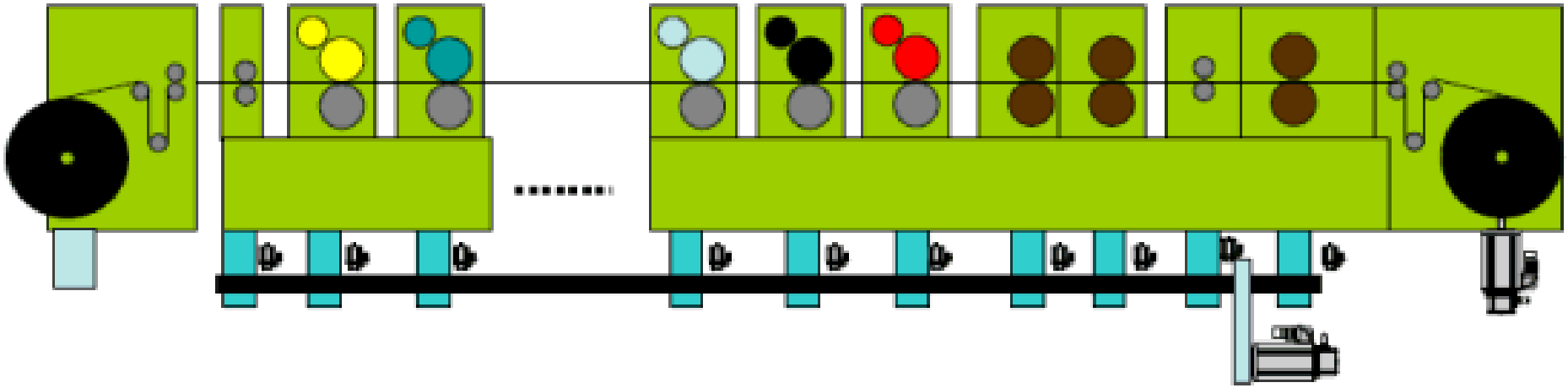



Overview of Motion

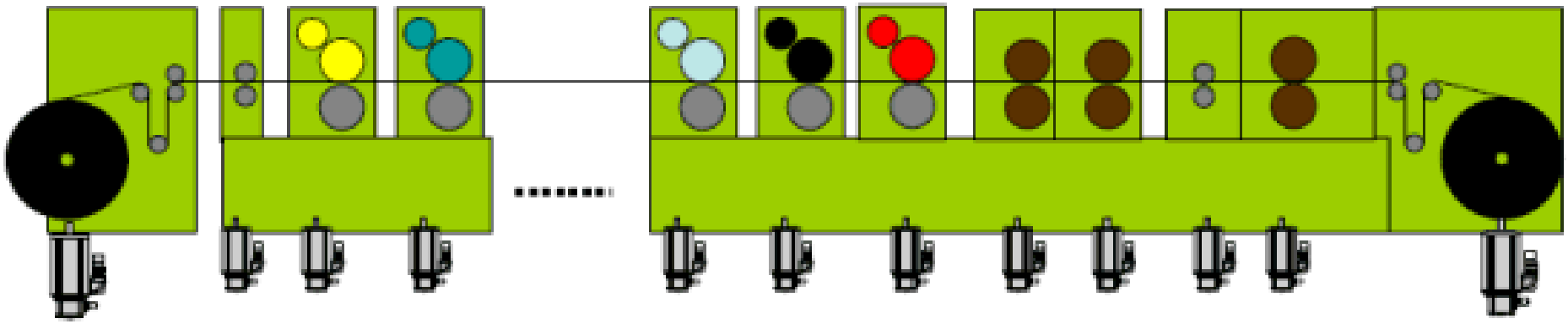
- Unwind, material exchange.
- Speed Synchronous between rotary and linear motion.
- Position Synchronous between rotary and rotary motion.
- Glue injection based on the angle of roller axis.
- Temperature control of heater.
- Phase adjustment and phase compensation (F/R).



Mechanical Axis vs. Electronic Axis



Mechanical Axis

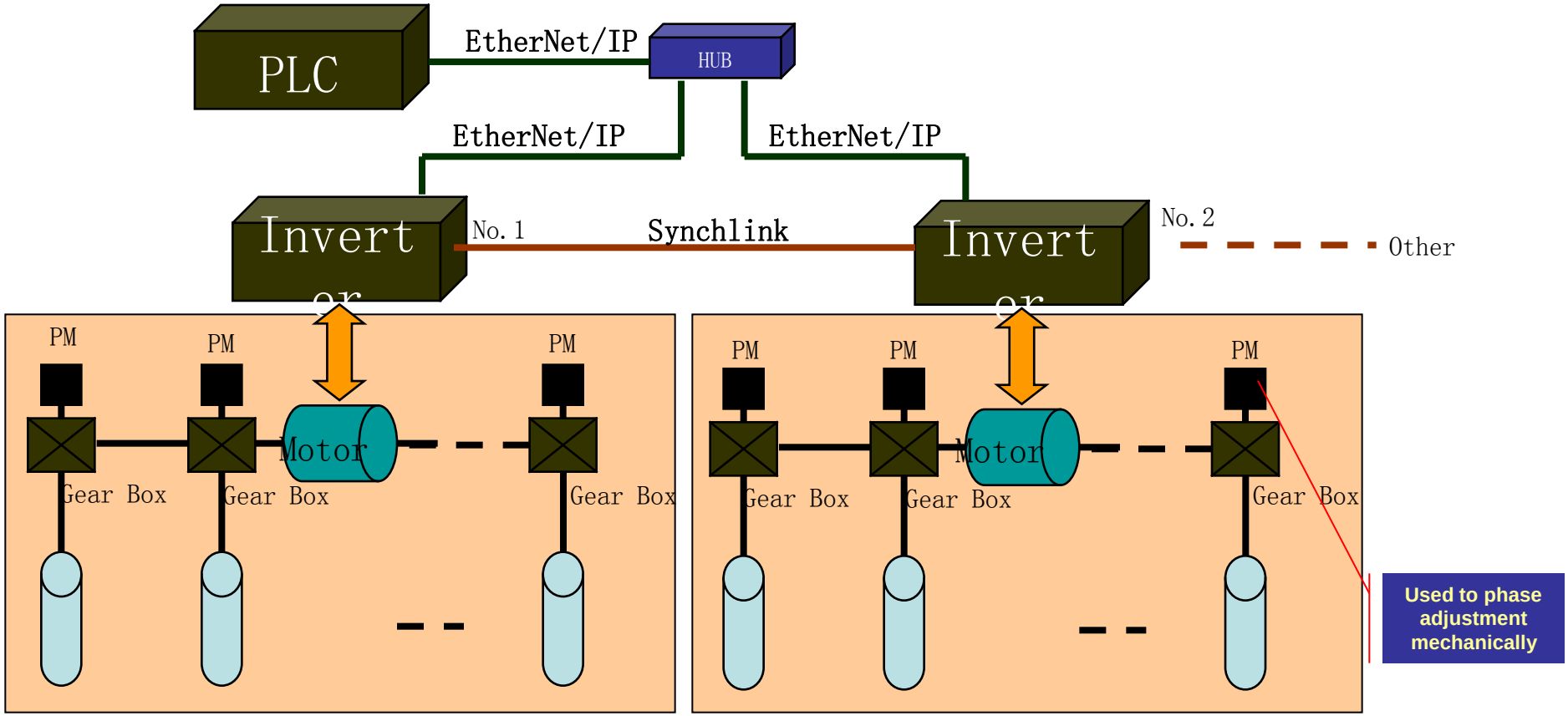


Electronic Axis

Main Shaft

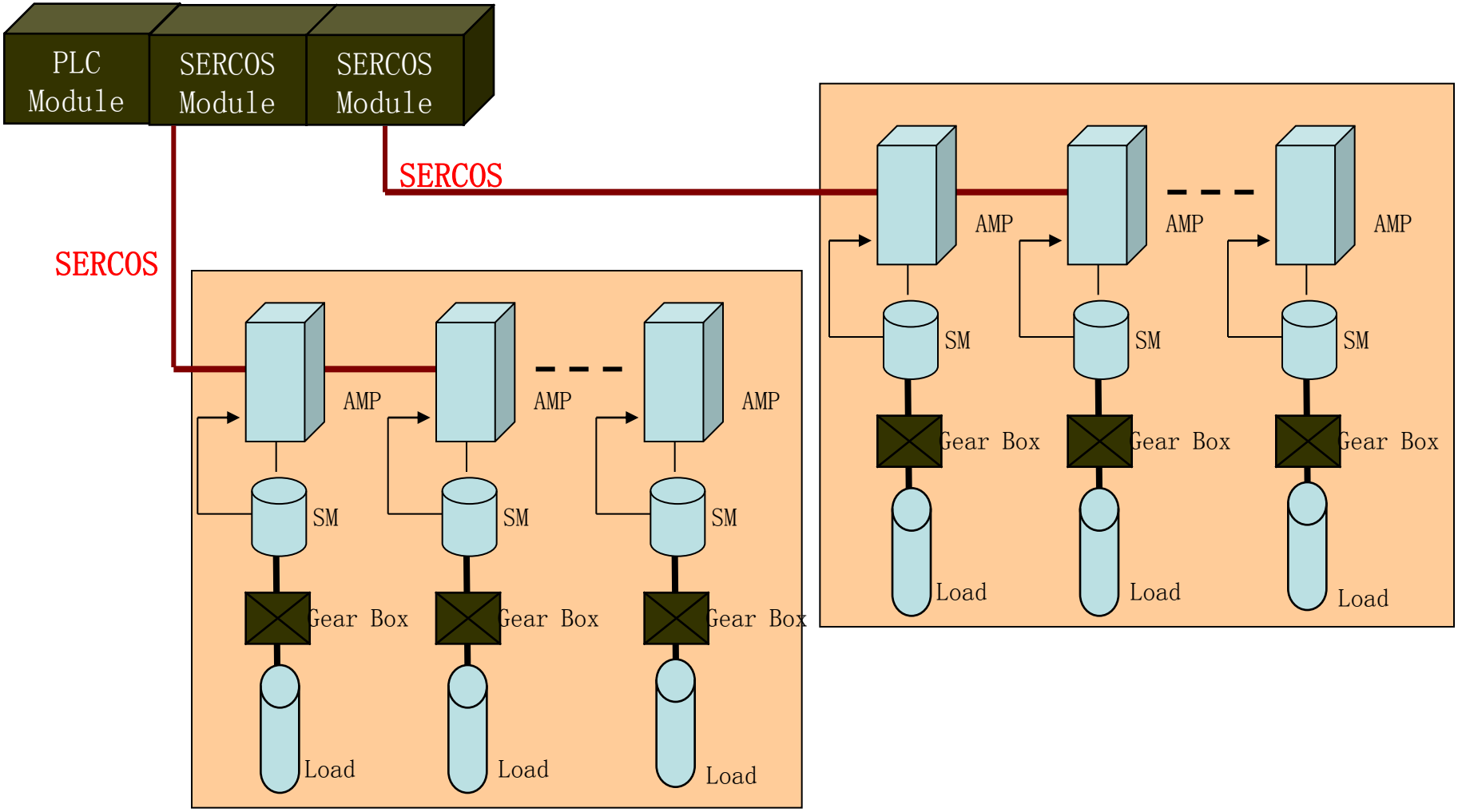
There are several inverters and all of them are running synchronously through Synchlink network. At same time operator can execute phase adjustment using Permanent Motor installed on gear box.

Synchlink
-Start Topology
-Daisy Chain Topology
-Ring Topology

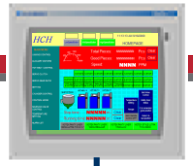


Shaftless

There are many servo system through SERCOS servo system controller network.



System Overview - Star Topology



PanelView Plus

EtherNet/IP

InView

1783-US08T

PF 70 PF 70 PF 70

COGNEX
(Vision System)

Point I/O Point I/O Point I/O

ControlLogix

Nordson
(Melter)

Nordson
(Melter)

MSR

SERCOS
Fiber-Optic Ring
(SErial Real-time
COmmunication System)

Kinetix 6000 Kinetix 6000 Kinetix 6000

Electric Cylinders

New!!

Linear Motor

Rotary Motor

Rotary Motor

Rotary Motor

System Overview - Star Topology


PanelView Plus

1783-US08T

EtherNet/IP

PF 70 PF 70 PF 70


COGNEX
(Vision System)

InView


Point I/O Point I/O Point I/O


Nordson
(Melter)

Nordson
(Melter)

New!

ControlLogix L73/L75

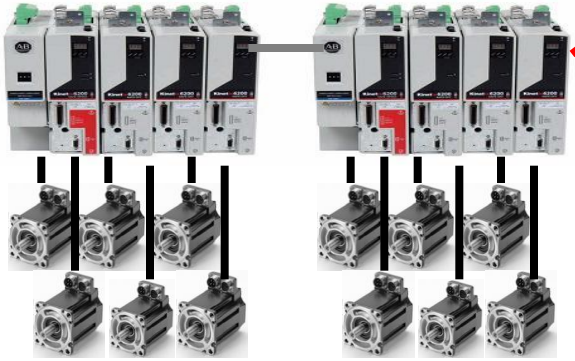
SERCOS
Fiber-Optic Ring


Encoder


Hinge Switch


Electric Cylinders

Kinetix 6200 Kinetix 6200




EMG Button


Linear Motor


Direct Drive Motor

Rotary Motor Rotary Motor


Guard Locking

System Overview - DLR Topology

Guard Locking

Encoder

Kinetix 6500

New!

Kinetix 6500

Hinge Switch

ControlLogix L73/L75

PF 70

New!

Linear Motor

Rotary Motor

Rotary Motor

EMG Button

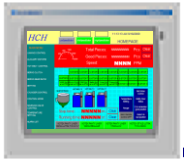
PF 70

Ethernet/IP

Electric Cylinders

Direct Drive Motor

COGNEX
(Vision System)



PanelView Plus

InView

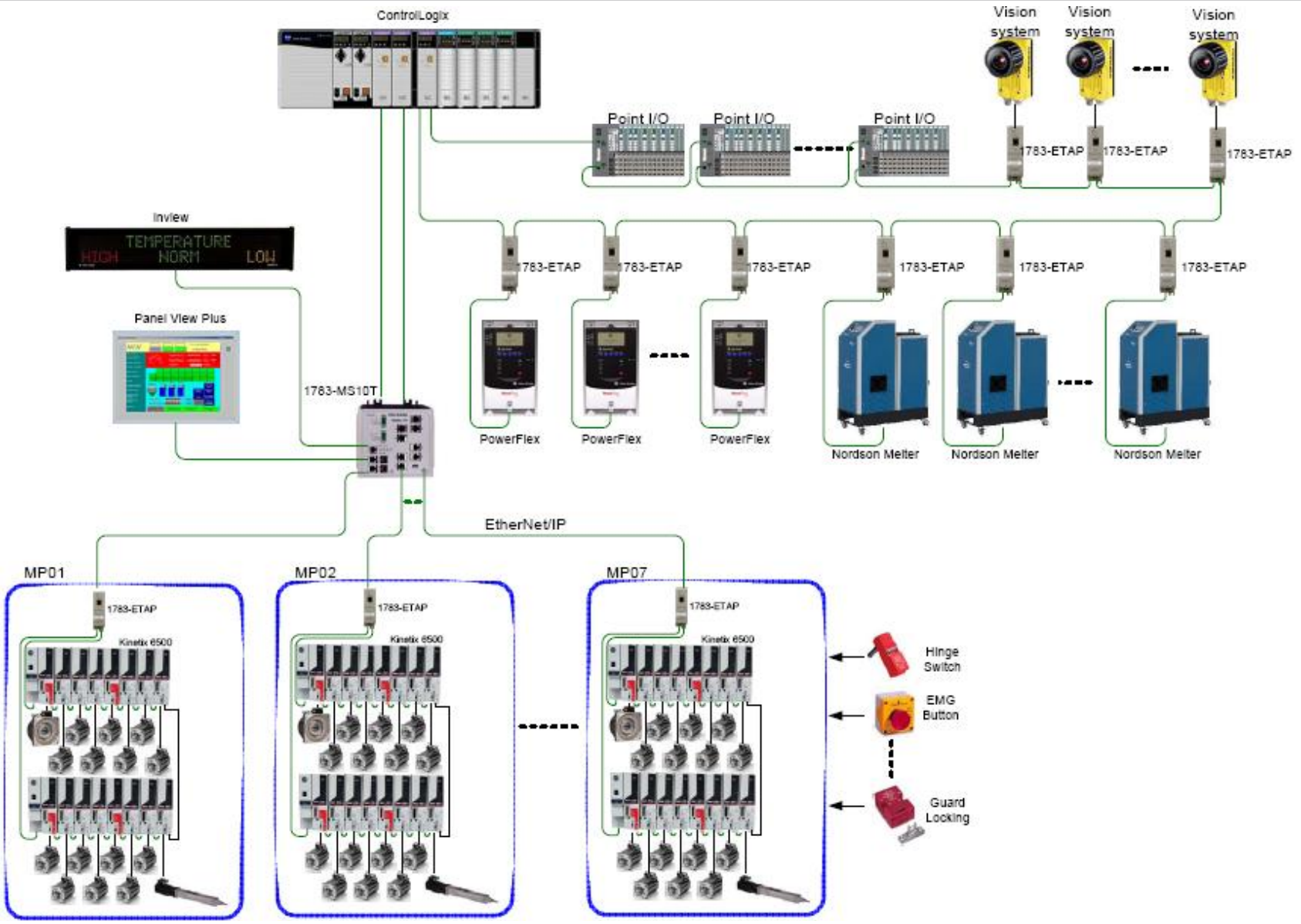
Point I/O

Point I/O

Nordson
(Melter)

Nordson
(Melter)

CIP MOTION Integrated Architecture



Encompass Partners

COGNEX

In-Sight 5000
Vision System

KEYENCE

ITW Dynatec
The Next Level of Technology

Nordson

Wahrheit 跨海工贸有限公司
Wahrheit Trading CO,.LTD

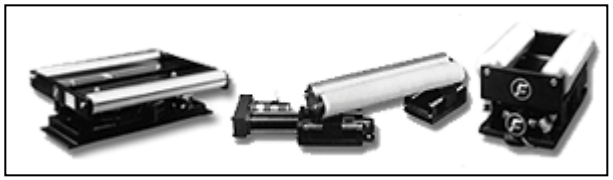
Filedbus
- Profibus DP
- EtherNet/IP
- ControlNet
- DeviceNet

Webguiding

AltaSpray Applicators

AltaBlue Adhesive Melters

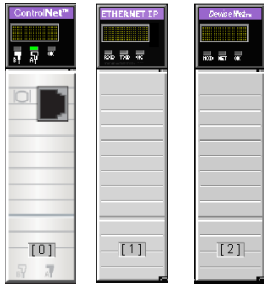
BST International



Field Bus on Nordson Melters with IPC

Anybus Communicator in KC's melter

HMI



Communication Module

Monitor
- Temperature
- Pressure…

Operation
- Start
- Stop…

EtherNet/IP

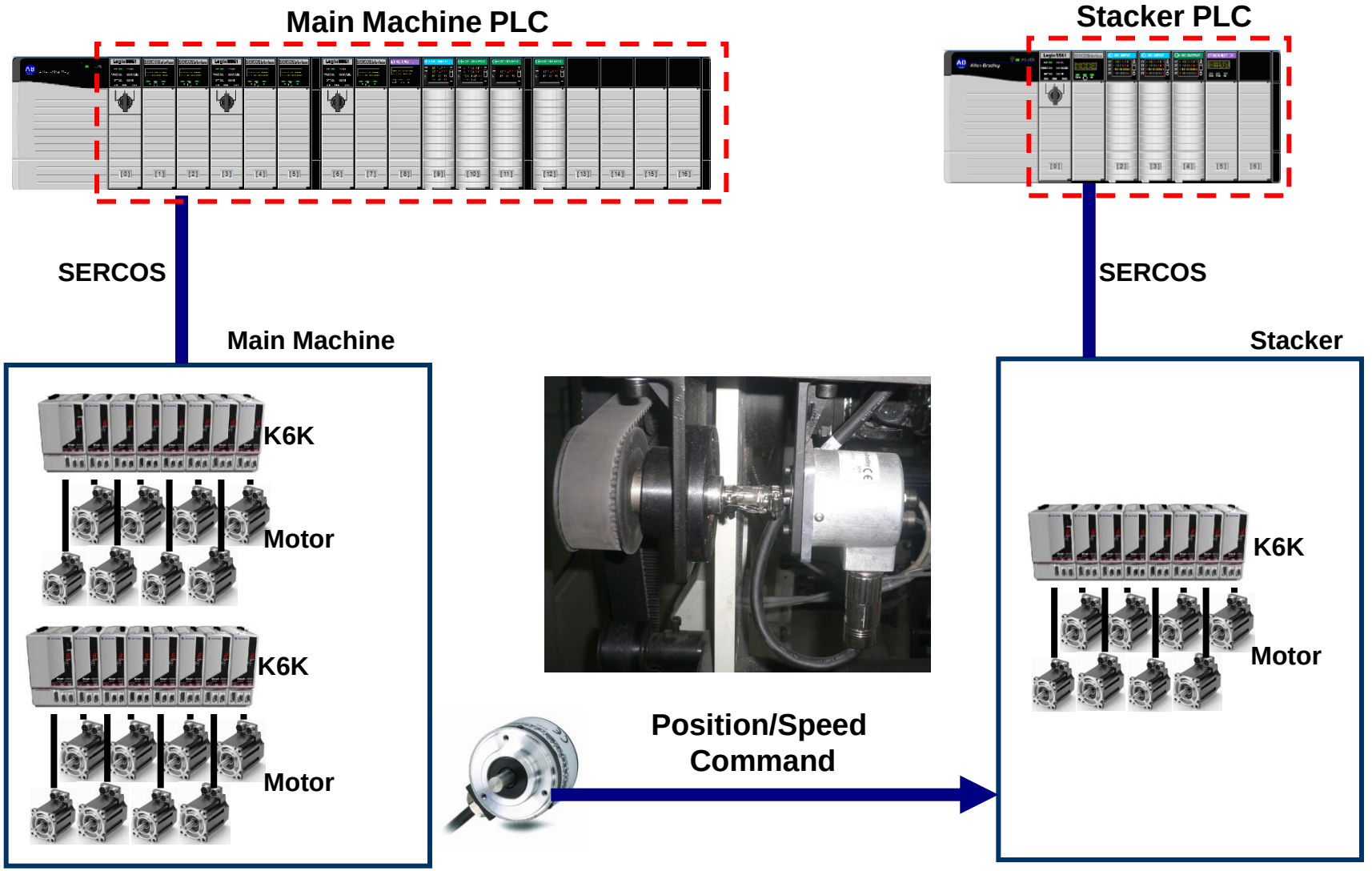
ControlNet

DeviceNet

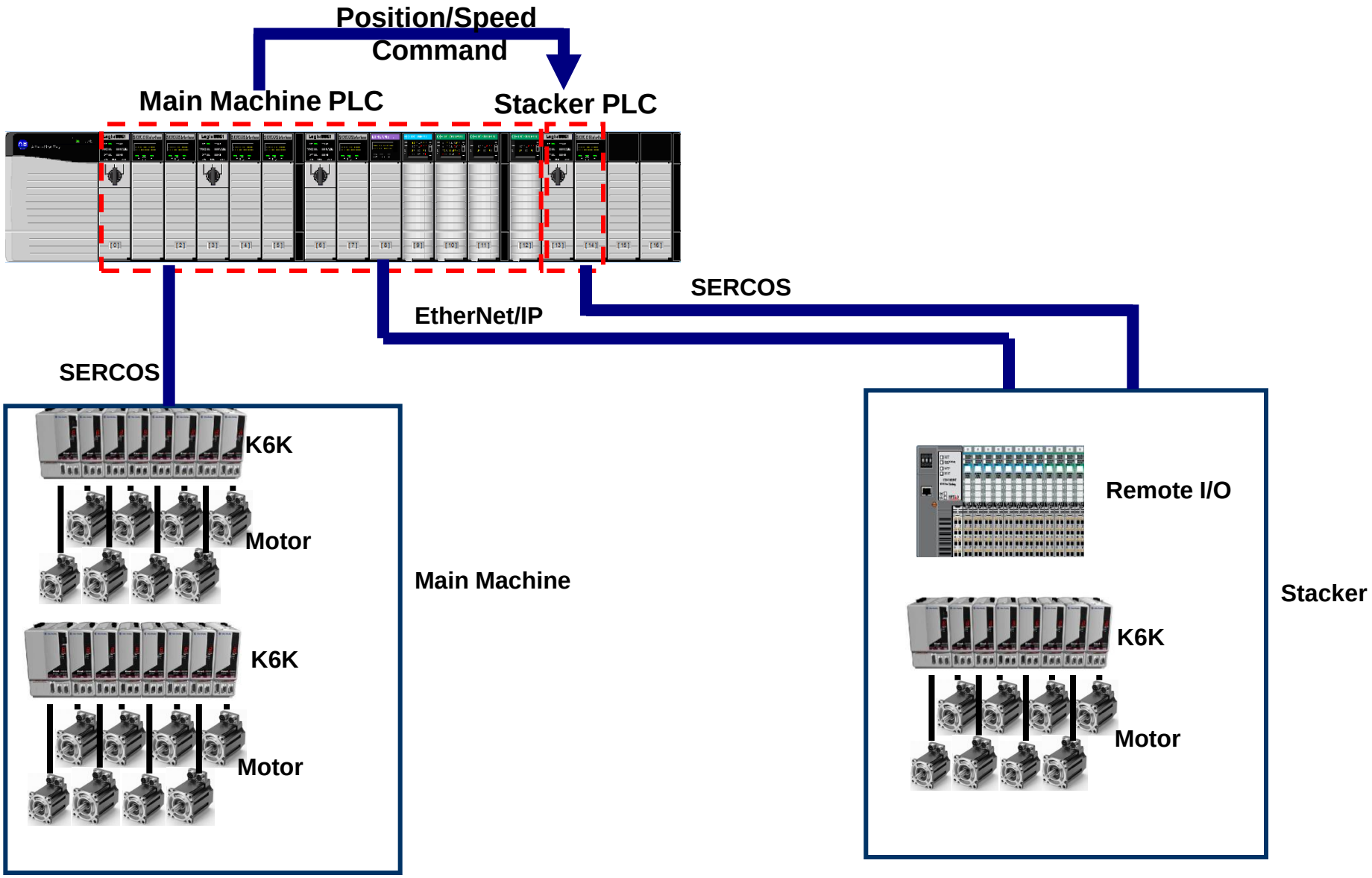
Melter

Anybus®
Connectivity solutions for
AS-i Bluetooth CANopen CC-Link
ControlNet CompoNet DeviceNet EtherNet/IP
FIPIO FL-net INTERBUS J1939 LonWorks
Modbus PROFIBUS PROFINET USB

Before Optimization



After Optimization



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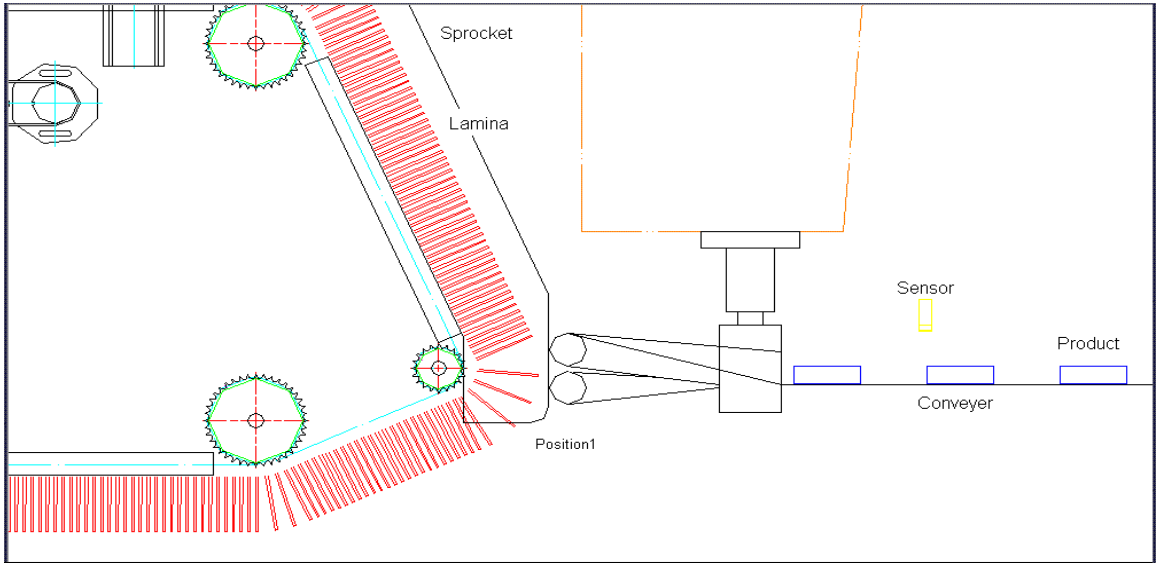
Rockwell Automation

Stacker

Simon Zhang
AP/China/Senior GOTC

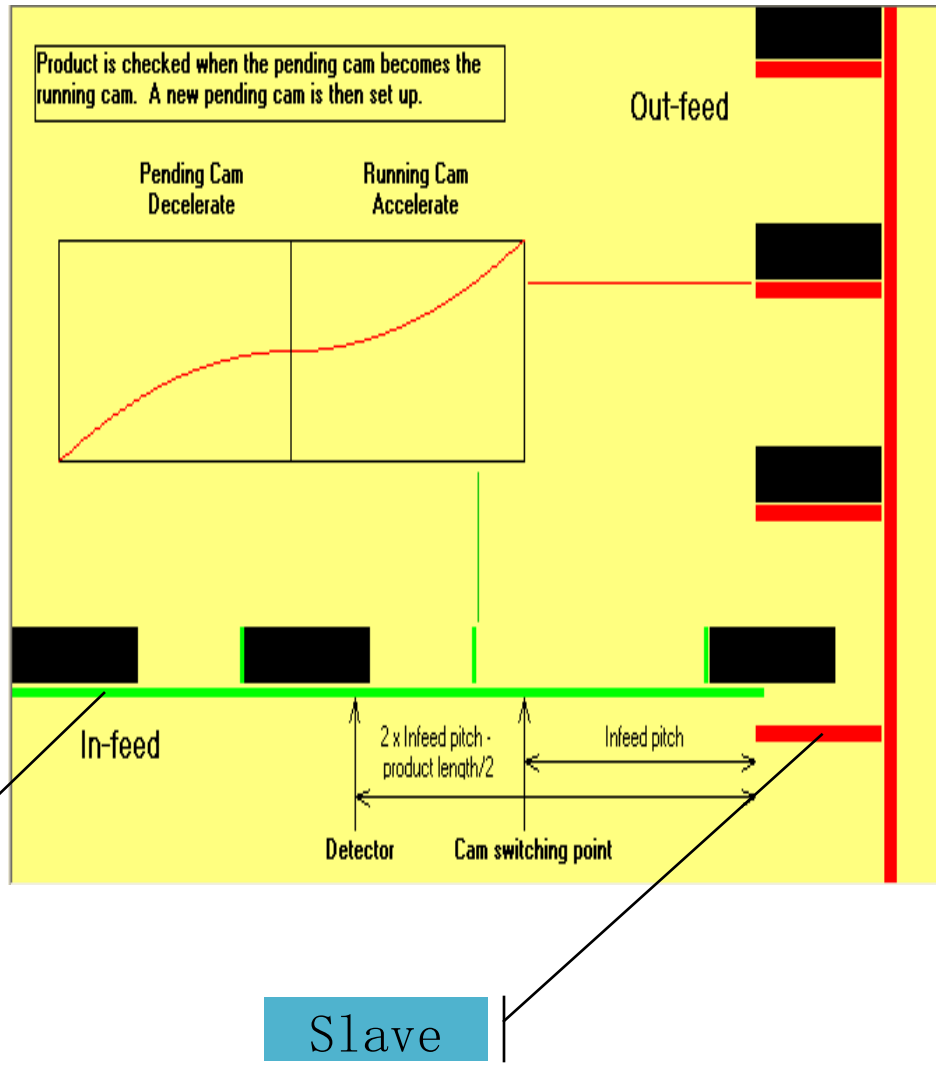
Project Background

- This stacker machine is going to work with the sanitary line that HCH is building for Vietnam KC.
- The highest speed of the stacker machine that HCH has done before is 600ppm. This time they want to reach 1000ppm.
- This stacker machine run in two different modes:
  - Continuous mode: The products on the conveyor are continuous. The conveyer and the sprocket run continuously with a gear ratio.
  - Interruptive mode: Because the products may be absent sometimes, the sprocket should decelerate, accelerate or stop accordingly.



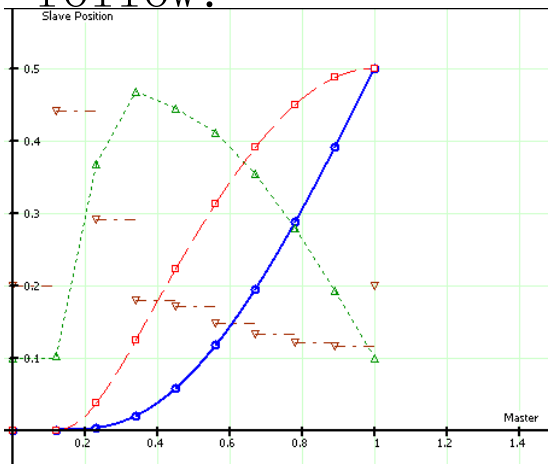
Project Key

- For running in 1000ppm, the sprocket can’ t stop and start in one product circle. So we need foreknow if there is a product coming or not. Then we can decide the run mode of the sprocket.
- For smoothing the accelerated or decelerated action, we need design the accelerated CAM and the decelerated CAM.
- Synchronized with the product signal getting, the master (the speed conveyor) should output a cam.

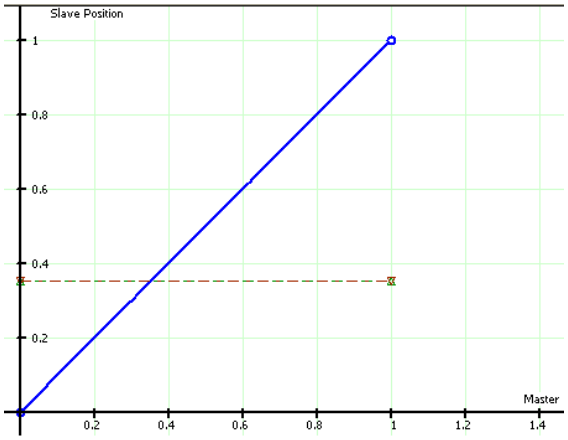


Rockwell Automation Solution

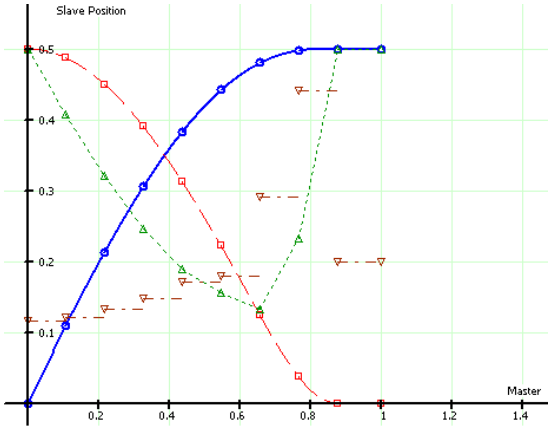
- We define four actions for the sprocket. The cams are as follow:



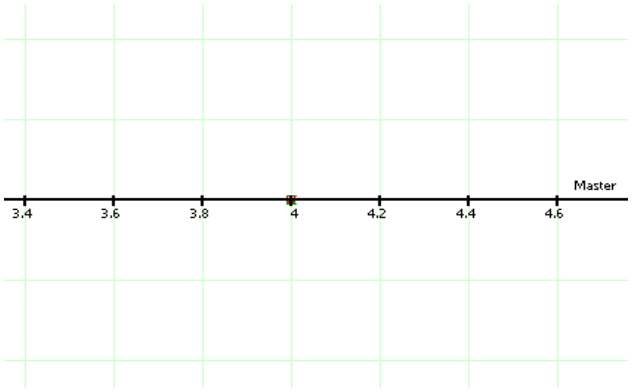
Acceleration



Cruise

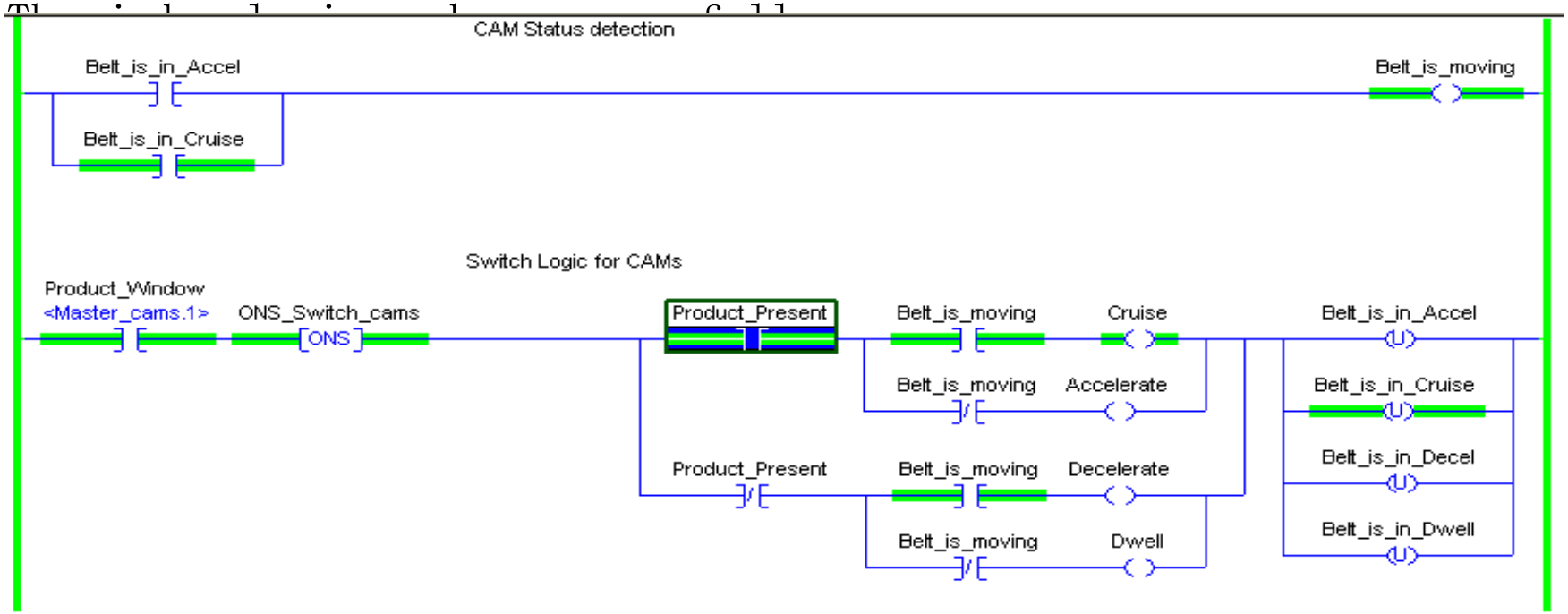


Deceleration



Dwell

Rockwell Automation Solution

- The speed feedback of the conveyor is as the master. Use MAOC instruction to create a master CAM.
- Put the sensor on the position: 2*Infeed pitch—product length/2
- 

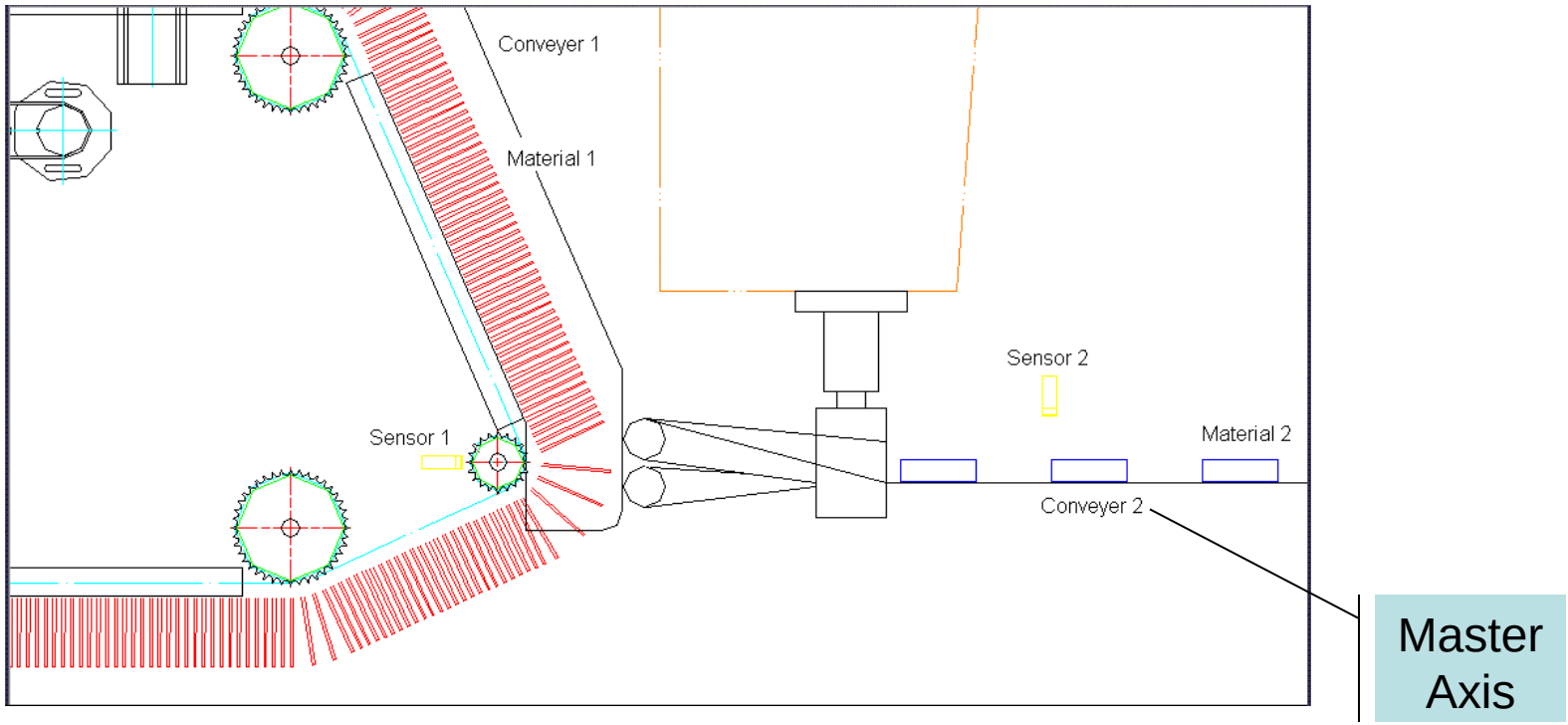
- Then run corresponding MAPC

Summarize

- With RA solution, the accelerated and decelerated action will become much smoothly, and can reduce the mechanical impact consumedly.
- Can reach the customer’s request, 1000ppm
- Easy to understand and learn

Function Analysis

Function Analysis



- The base function of stacker is mixing material 1 and material 2 synchronously from two different conveyers.

Thanks!