

ANIE
AUTOMAZIONE



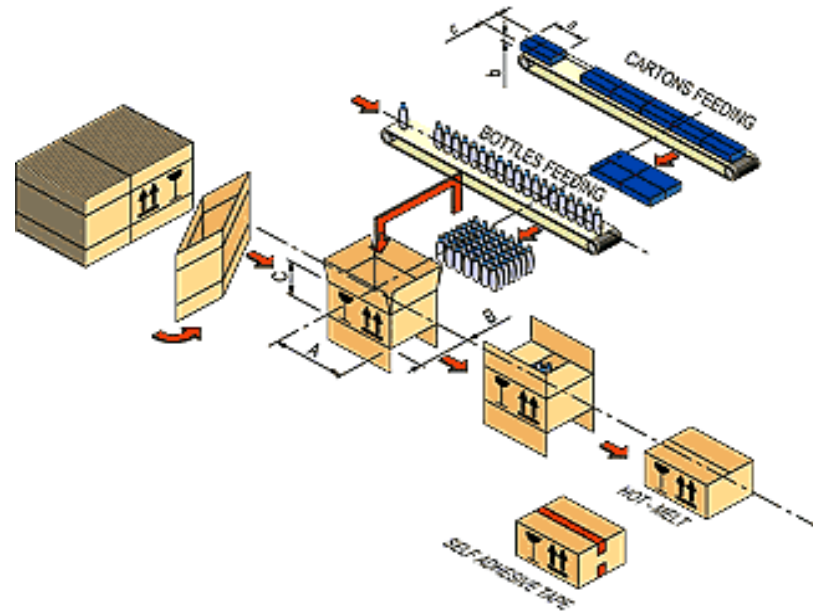
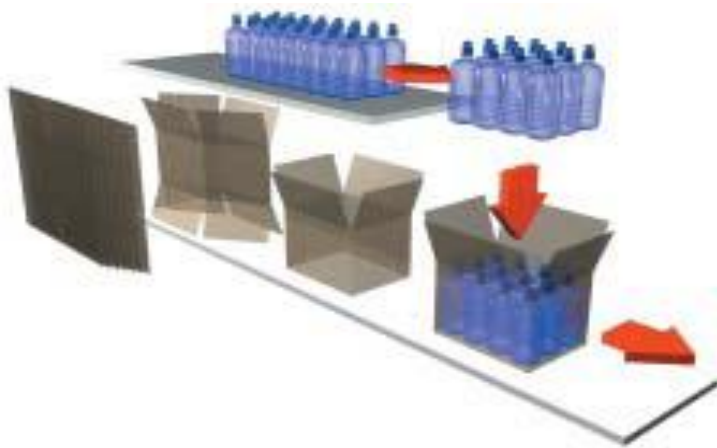
Motion Control: The core of a packaging machine

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Schneider
Electric

Example :

Vertical Case Packer, 4 controlled axes



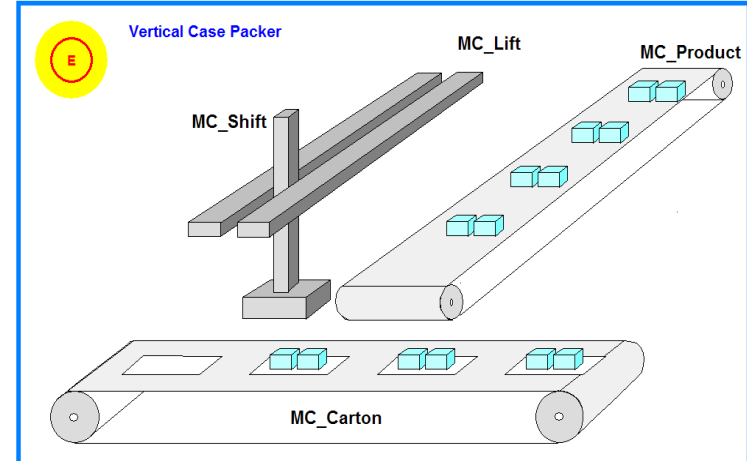
Function analysis

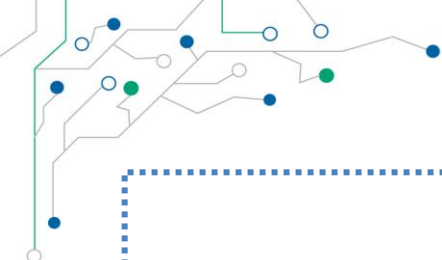
Request: This machine is a vertical case packer.

Products and boxes are on different levels on different belts.

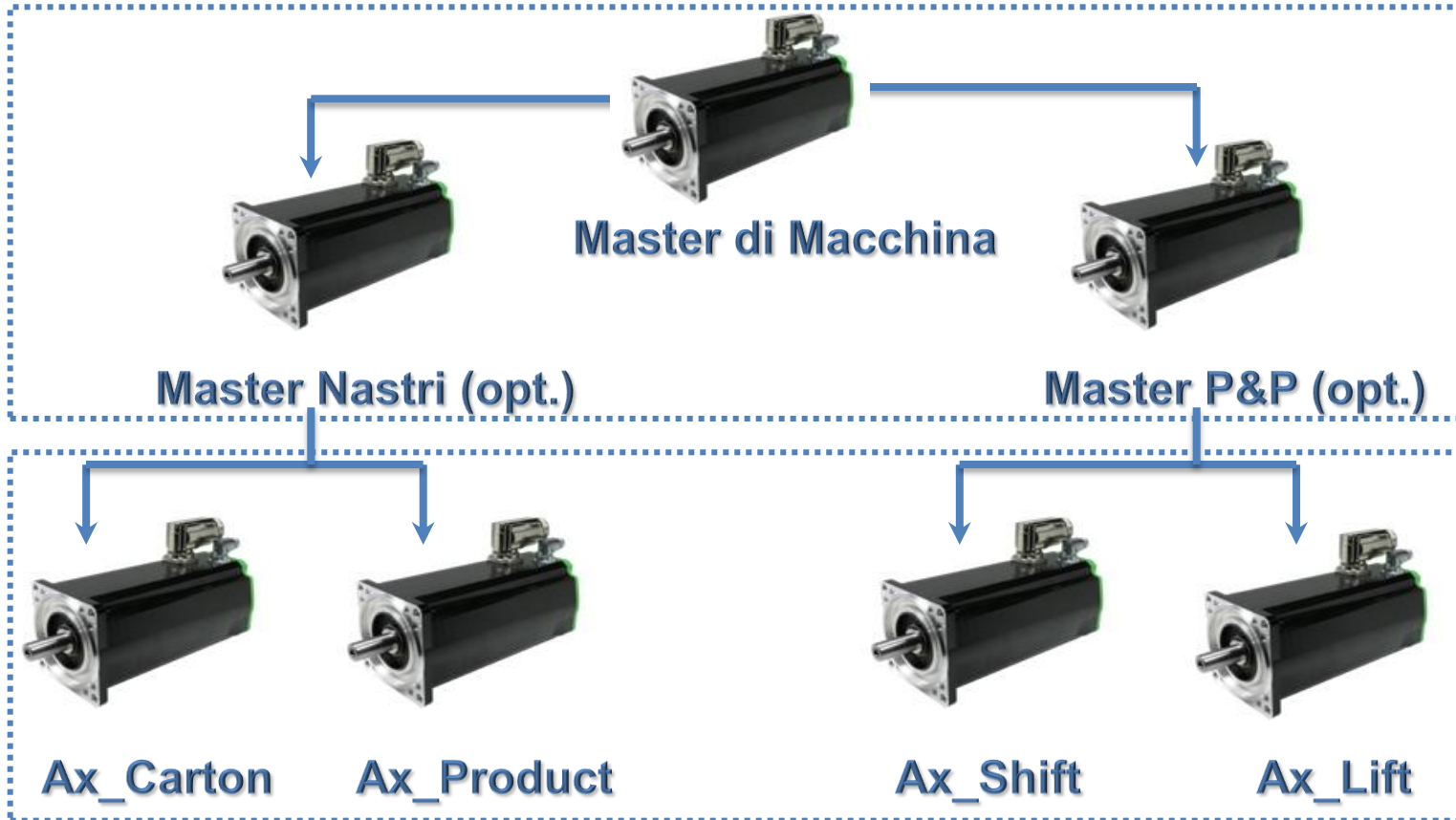
Solution: the Filling system consists in two belts, that move the products in specific directions.

Two coordinated axes (Pick & Place)
pick the products from a belt and
place on the other belt inside the
boxes.





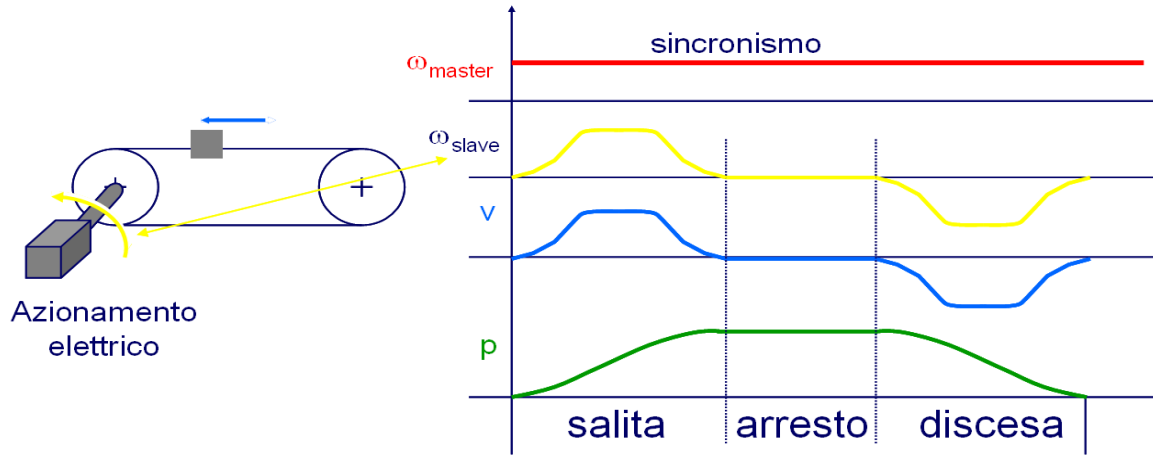
Schematic



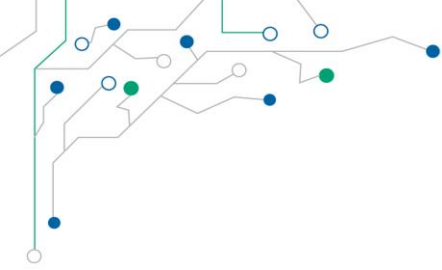
Virtual Axes

Real Axes

Motion design: Electronic Cam



Electronic Cam is a system that generates periodic profiles with precise mathematical connection between one motor (master) and another (slave). It's a connection made by phase, velocity and acceleration.



Motion Sizing

Starting from the functional requirements, all motion functions are defined for each controlled axes.

Through engineering tools, it's possible to describe the motion profiles, define the mechanical couplings and then size the both motors and drives.



Axis Lift

Process Steps:

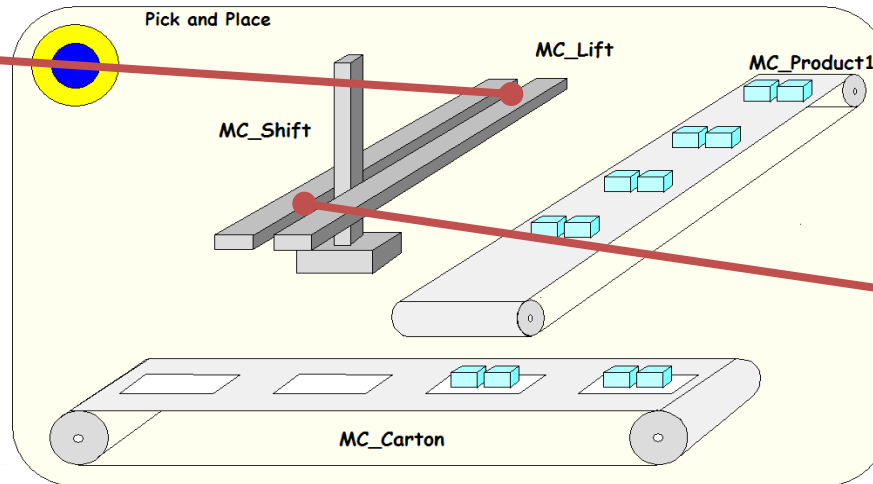
HIGH ON PRODUCT, lift axis in the locked position up and SHIFT axis in the locked position on the belt products

HIGH ON PLACE, lift axis in the locked position up and SHIFT axis in the locked position on the belt cartons

PICKUP ACTUATOR, it's a valve located on top axis LIFT, *activation/deactivation* is necessary for *pickup/place* of the Products

**HIGH ON
PRODUCT**

**PICKUP
ACTUATOR**



**HIGH ON
PLACE**

Motion profile design

Axis Straight - Segment Straight

Name: Straight

Start situation: Dwell

End situation: Dwell

Motion Law: modisin

Starting Position X: 0

Starting Position Y: 0

Starting Gradient: 0

Starting Curvature: 0

Ending Position X: 360

Ending Position Y: 100

Ending Gradient: 0

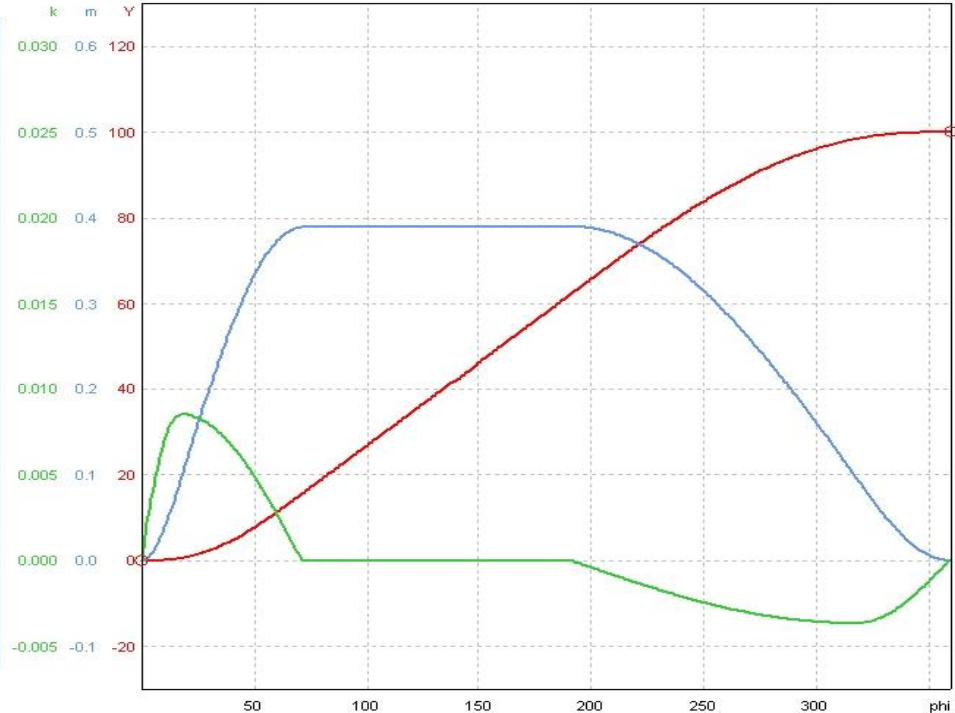
Ending Curvature: 0

Motion Law

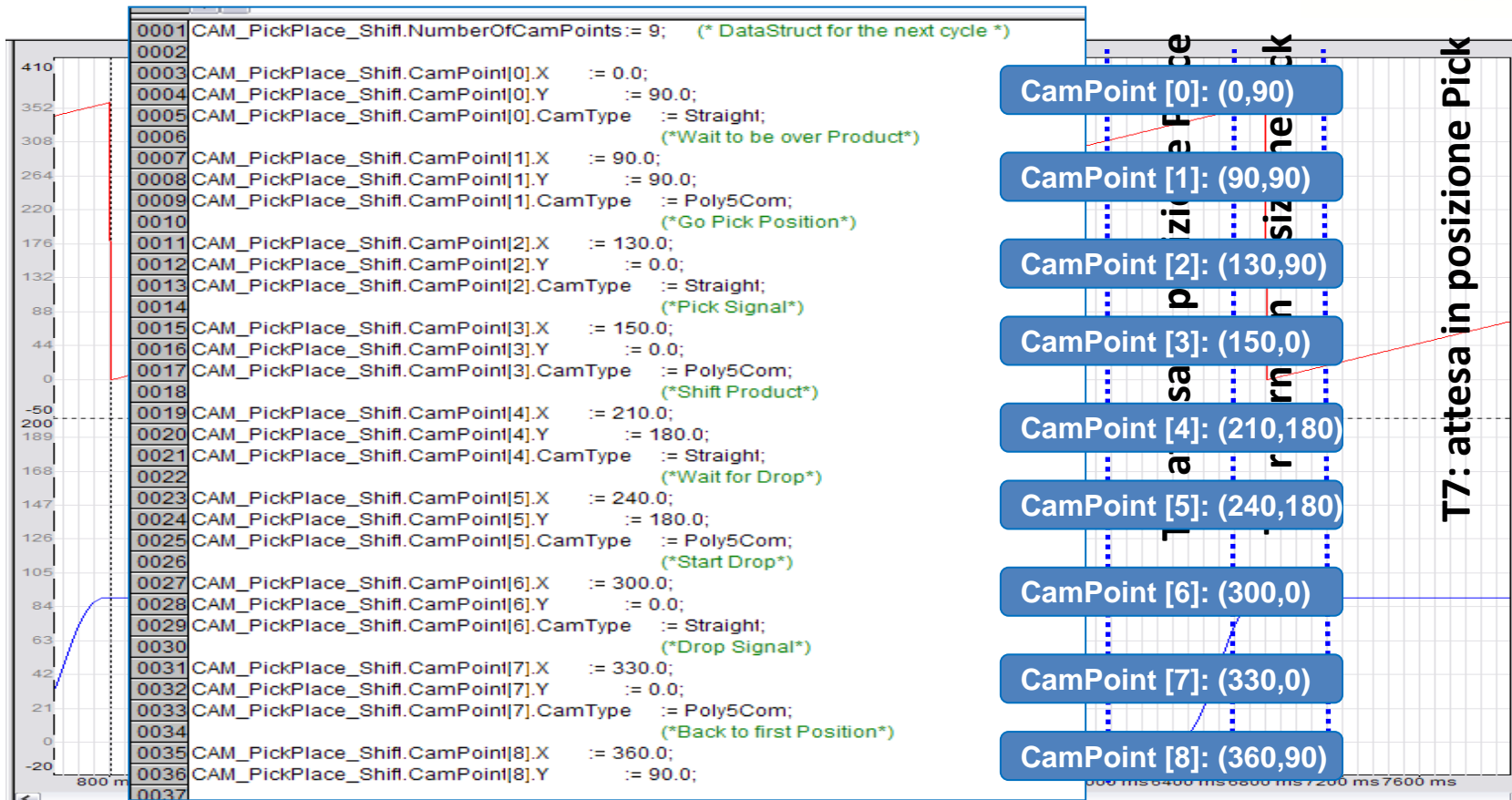
Lambda: 0.3

C: 0.666

OK Cancel Help

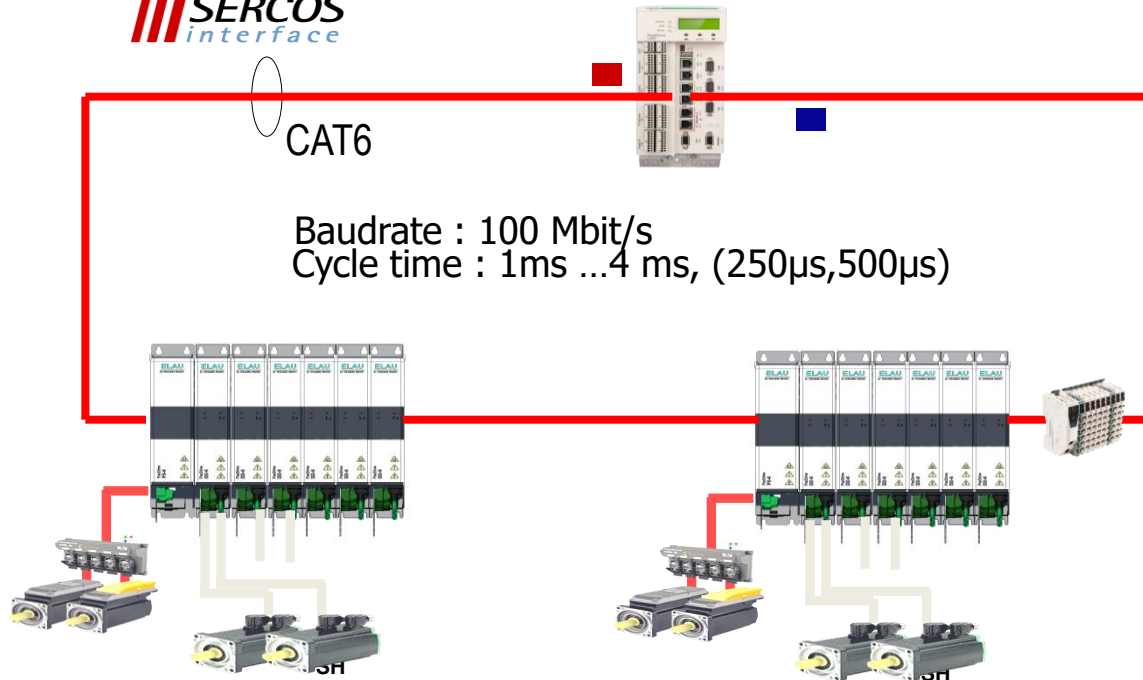


Motion profile defined



Sercos III: The information processed by the Motion Controller goes to drives and motors

SERCOS interface



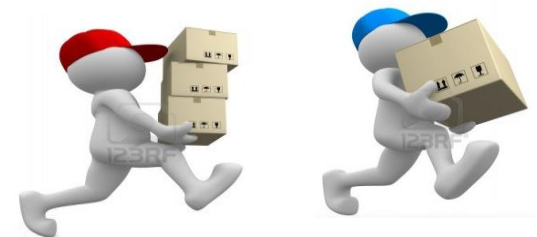
Ethernet Real Time

Telegram

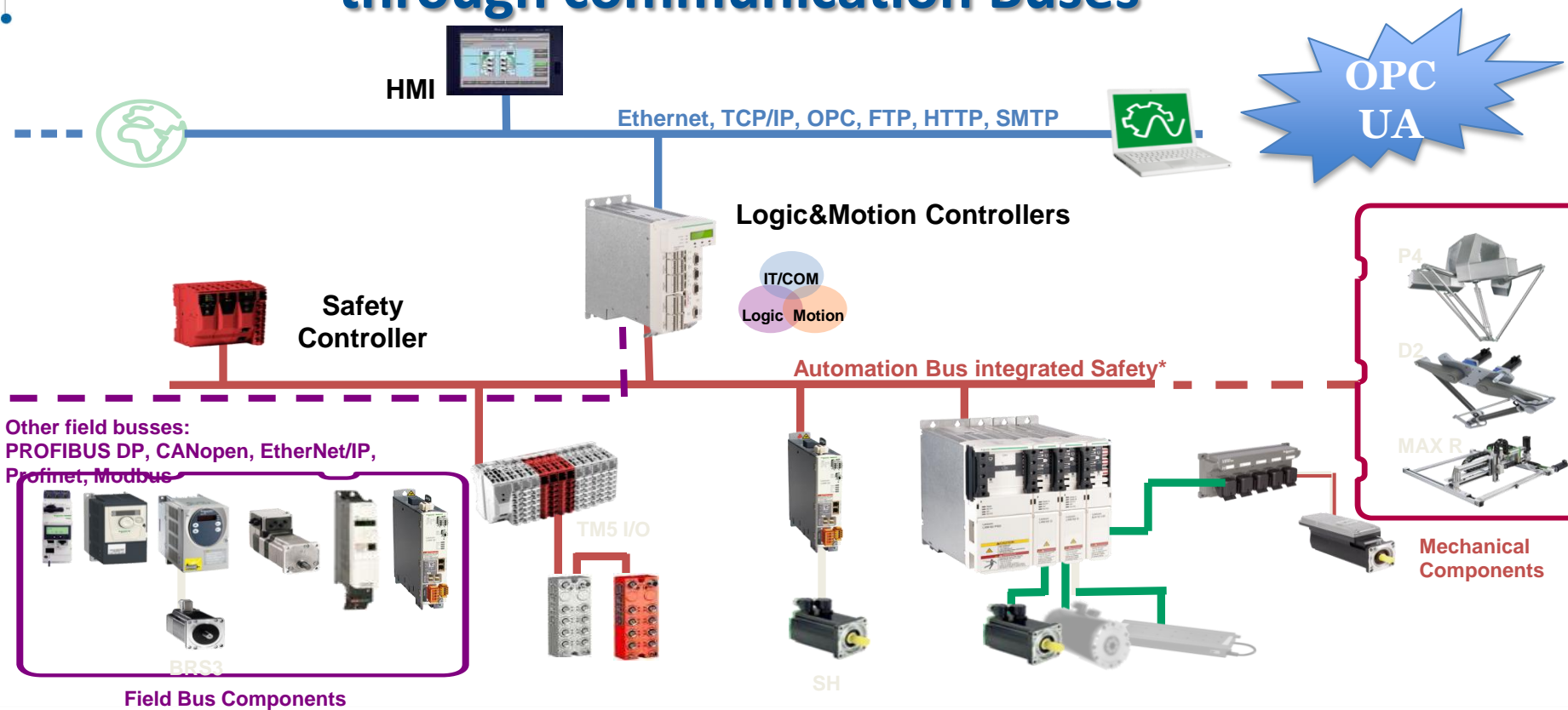
Ethernet standard

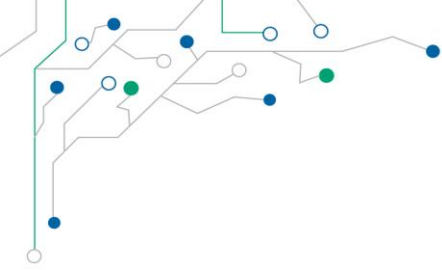
Line topology

Ring topology



From the machine to the rest of the world through communication Buses





Thanks for your attention