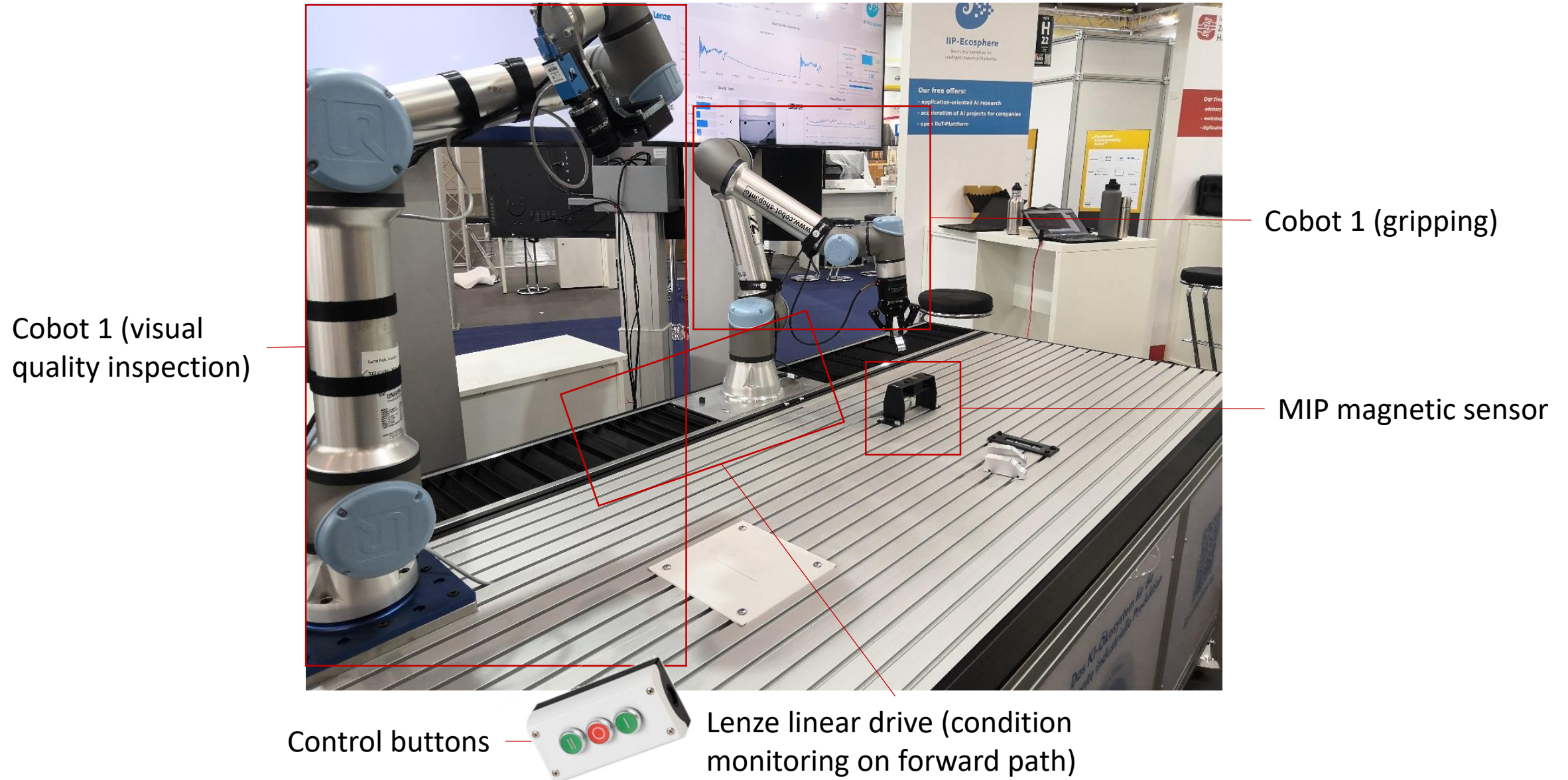


# EMO'23/HM'23 demonstrator setup



Cobot Control  
AI Application

Lenovo Server

Platform core

2 Schalter

PLCnext AXC f3152



Elektr.



IP: 192.168.2.10  
Port X2  
4840: OPC UA server

Container:  
\*: AAS VAB server



LAN

IP: 192.168.2.1  
9001: Platform AAS server  
9902: Platform AAS registry  
9003: Platform VAB server  
8883: Central AMQP Broker  
9989: MDZH AAS server/registry  
9090: Prometheus server  
9091: Prometheus alert mgr  
\*: Exporter  
\*: APP AAS VAB server  
**4000: BaSyx UI**  
4200: Mgt UI  
4201: Tablet UI  
5001: Local Docker Registry  
Container:  
\*: AAS VAB server

U2x Cam



IP: -> Beckhoff

LAN

QR Code Reading  
Photo Taking  
Reaction to AI Result



2x UR5 Cobots

IP: 192.168.2.21  
IP: 192.168.2.23

LAN

LAN/Profinet



Managed Switches

IP: 192.168.2.30 (li)  
IP: 192.168.2.31 (re)



Proxmox: 192.168.2.11 (Eth1)  
GPU-VM: 192.168.2.13  
Bitmotec: 192.168.2.12  
1883: MQTT -> Grafana



IP: 192.168.2.80  
4840: OPC UA



IP: 192.168.2.40



IP: 192.168.2.81  
MQTT: 1883



IP: 192.168.2.82  
MODBUS TCP

Hardware connections at AXC F 3152

HM'23

Pin	PLC Global	After Trigger	Meaning
dio-1/IN01	HW_IN_1	HW_Button1	Start Cobot 1
dio-1/IN02	HW_IN_2	HW_Button2	Start Cobot 2
dio-1/IN03	HW_IN_3	HW_Button0	Quit

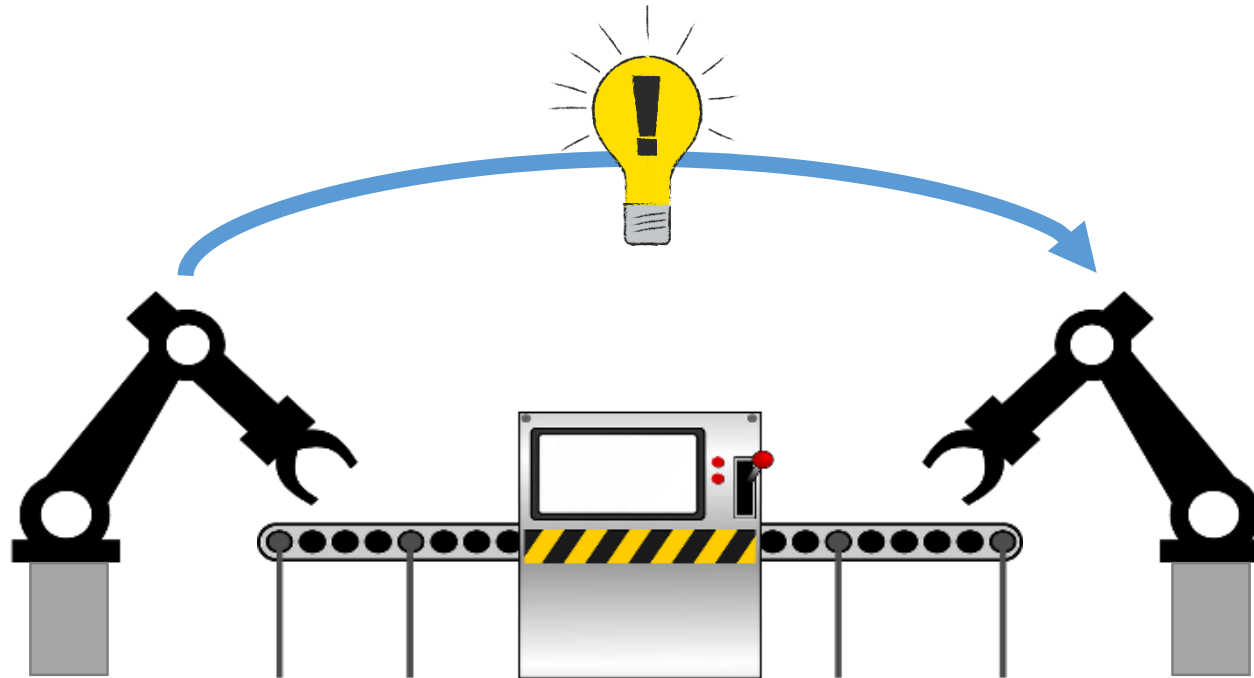


EMO'23

Pin	PLC Global	After Trigger	Meaning
dio-1/IN01	HW_IN_1	HW_Button1	Start Cobot 1
dio-1/IN02	HW_IN_2	HW_Button2	(Start Cobot 2)
dio-1/IN03	HW_IN_3	HW_Button0	Drive to start



# Federated Learning Path





Beckhoff → Decider  
bPicCounter: Short  
bPicScene: Short  
bPicTrigger: Short

Decider → Beckhoff  
bPicCounter: Short  
bPicScene: Short  
bPicTrigger: Short

PlcNext → Decider  
HW\_Btn0: Boolean  
HW\_Btn1: Boolean  
HW\_Btn2: Boolean  
PC\_ReadyForRequest: Boolean  
PC\_RobotBusyOperating: Boolean  
PC\_RobotBusyOperatingAddInfo: short

Decider → PlcNext  
PC\_StartOperation: Boolean  
PC\_Command01: Int16  
PC\_Quit: Boolean  
status: String [red, green, off]

Decider → AppAAS  
io: Boolean  
ioReason: Integer  
error: String []  
img1Error: String []  
img2Error: String []  
img3Error: String []  
errorConfidence: Double []  
imageUri: String []  
robotId: Integer  
aId: String



AAS



Forward Flow  
Backward Flow  
Param  
commented out

PlcNextOpcConn

PlcBeckhoffOpcConn

CamSource

FL-Client

Static AI

ActionDecider  
errorThreshold: Double

AppAAS (2x)

AppAas → MdzAasConn  
command=QUERY\_CAR\_AA  
param=<productId>

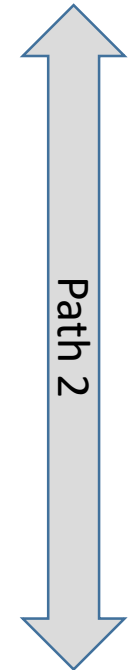
MdzhAasConn

CamSource → AI  
image: String base64  
imageUri: String  
side: String  
robotId: Integer

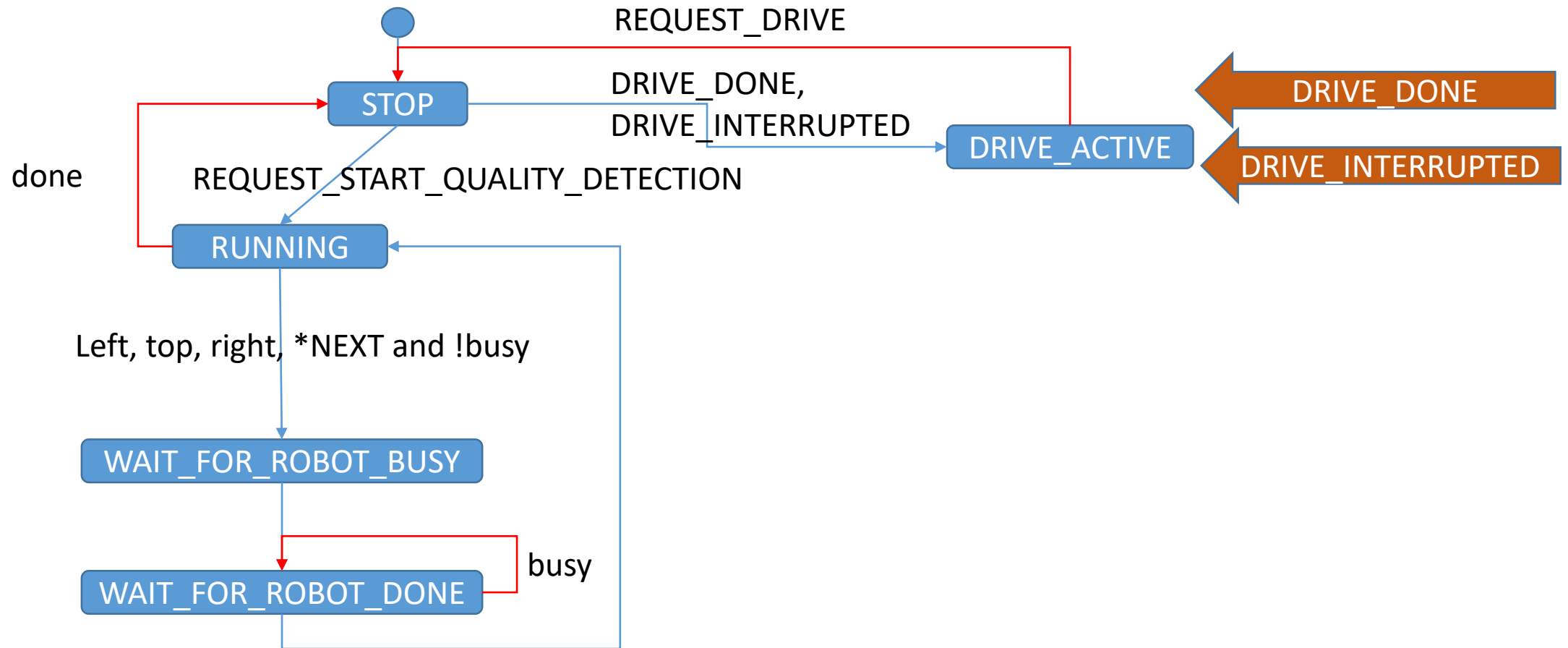
AppAAS → AI  
command=SEND\_FEEDBACK\_TO\_AI  
param=<feedback>

AppAAS → AI  
command=SEND\_MODEL\_CHANGE\_TO\_AI  
param=<modelId>

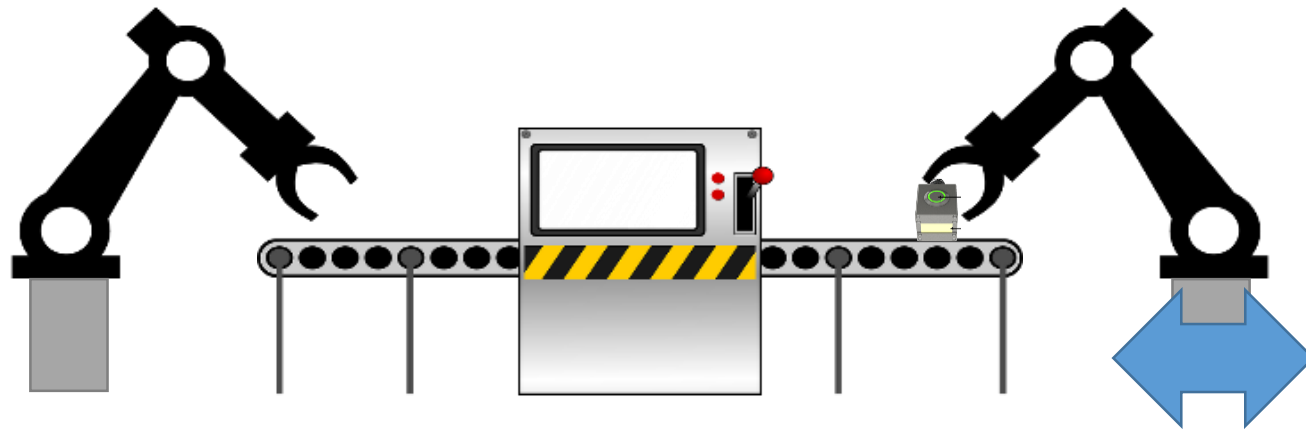
AI → Decider  
error: String [Shatter, Scratch  
, Geometry, Car missing, Normal]  
errorConfidence: Double []  
imageUri: String base64  
robotId: Integer  
aId: String

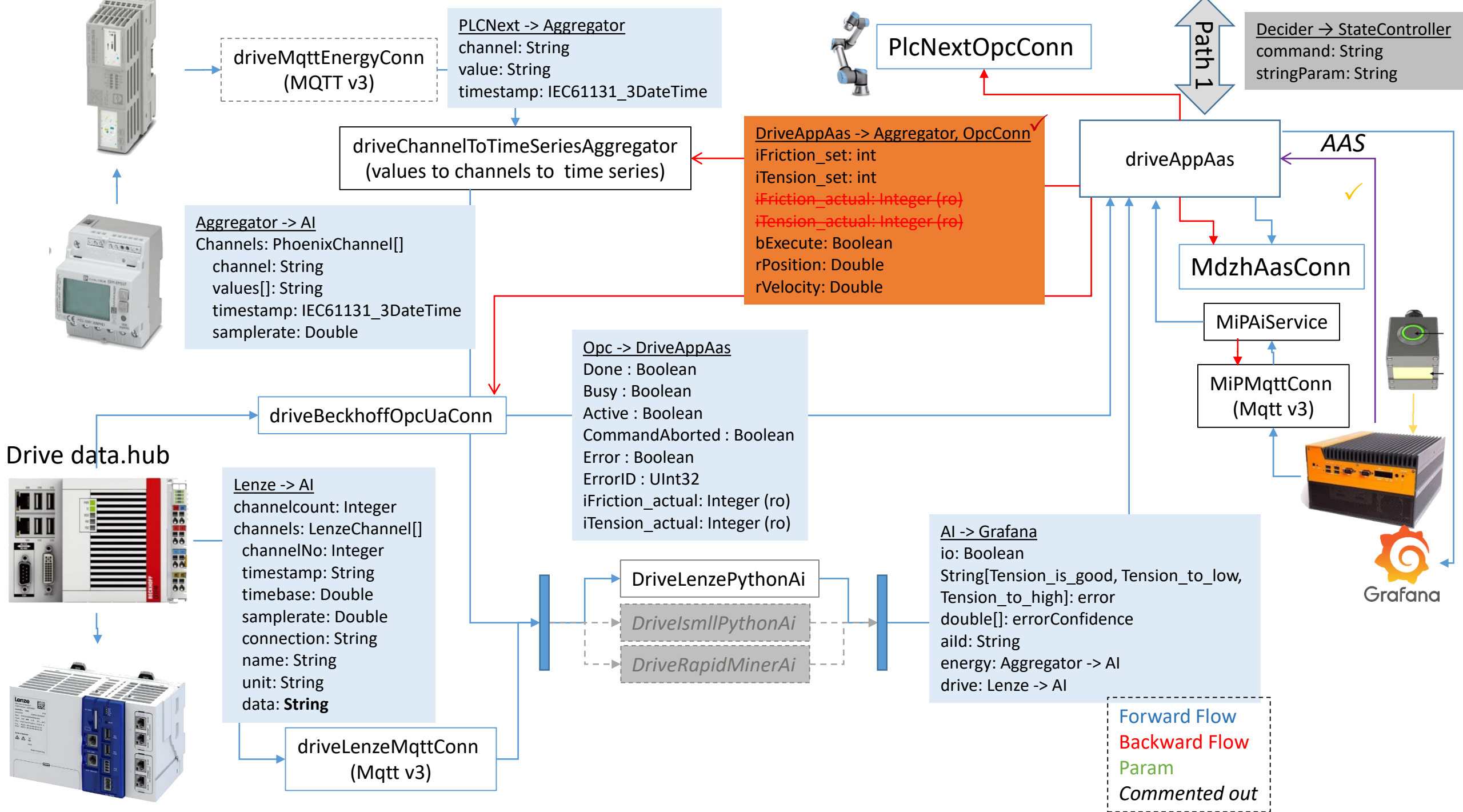




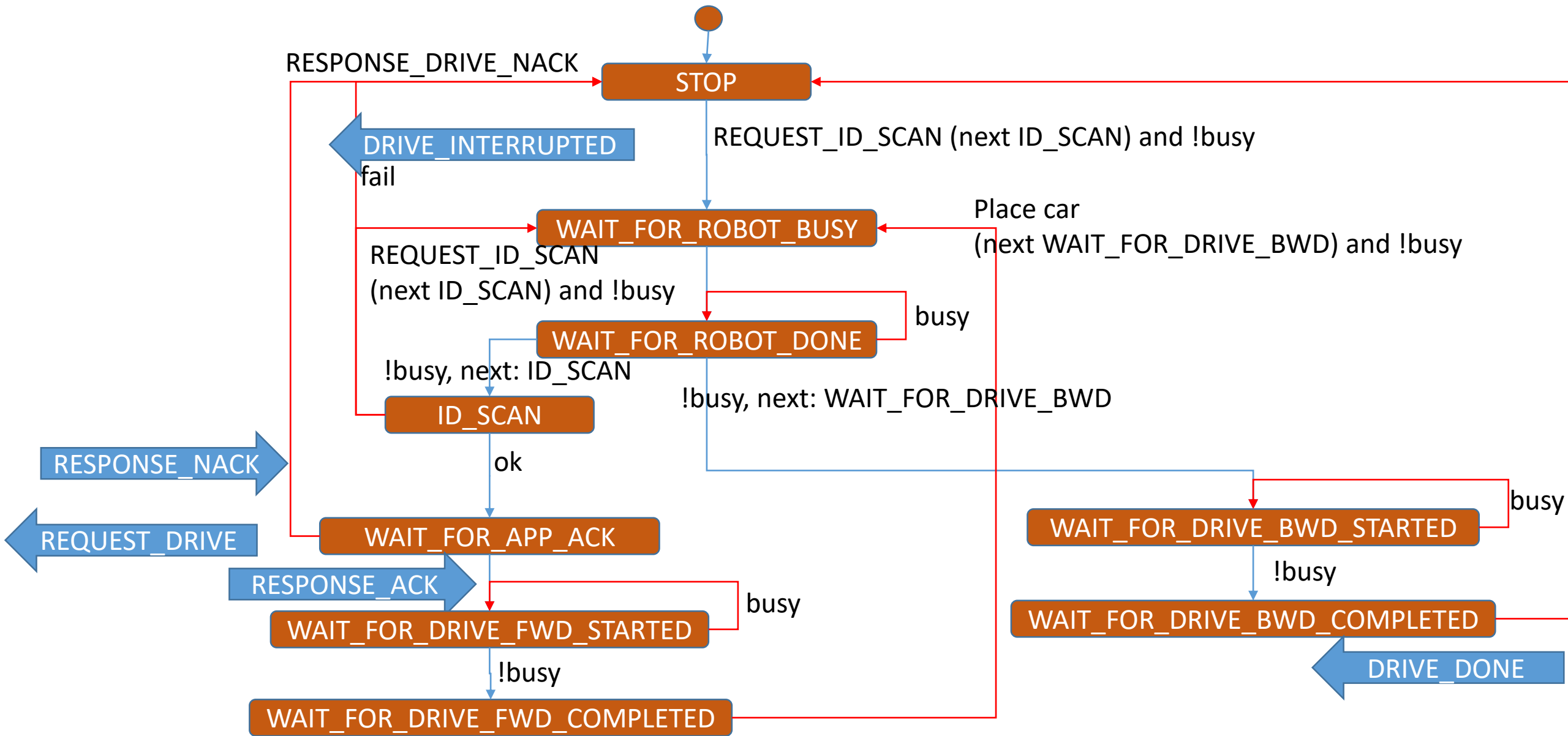


# Drive Path









# Cobot movements

(x) case in UR cobot-program

→ PLC auto-advance

→ PLC explicit next

