



FIELDCOMM GROUP™
Connecting the World of
Process Automation

Ethernet-APL migration demo

By using standardized technologies

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สวัสดี



Has over 40 years of experience in the field of process automation, including plant maintenance, construction and operation improvements.

Engaged in many leading roles throughout his career, with the latest one being the leading project manager of Digital Field Solution at Azbil Corporation where he worked on business development for HART and FOUNDATION Fieldbus solutions.

COMMON WISHES OF PROCESS AUTOMATION USERS

- Use existing systems forever without making them obsolete
- Keep up to date existing current system with the latest technology without painless avoid Outage and huge investment due to just major system updates
 - Continuous availability for decades
 - Avoiding the impact of vendor's discontinuation due to vendor's reasons
- Adapt to the realization of data requirements and optimization corresponding to the IT era while utilizing existing systems

HOW CAN WE MAKE IT REAL?

- To make these a reality, it is important to use standard technologies
 - A standard technology that is sufficiently widespread will not suddenly disappear, but will be inherited by various companies and technologies
 - A standard technology that is sufficiently widespread will not stop evolving
 - A standard technology that is sufficiently widespread will be passed on directly to the next generation of technology.

HART is a standard

- The HART a standard which is a well-established standard that it continues to evolve together with the 4-20mA technology.

HART is Evolving

Analog

4-20mA
2 wire
intrinsically safe

+Digital Communication +Wireless +TCP/IP

HART
Wireless
250Kbps

HART
FSK
1.2Kbps
2 wire
intrinsically safe

1993

HART
PSK/FSK
1.2/9.6Kbps
2 wire
intrinsically safe

2006

HART-IP
Ethernet
10,000Kbps~

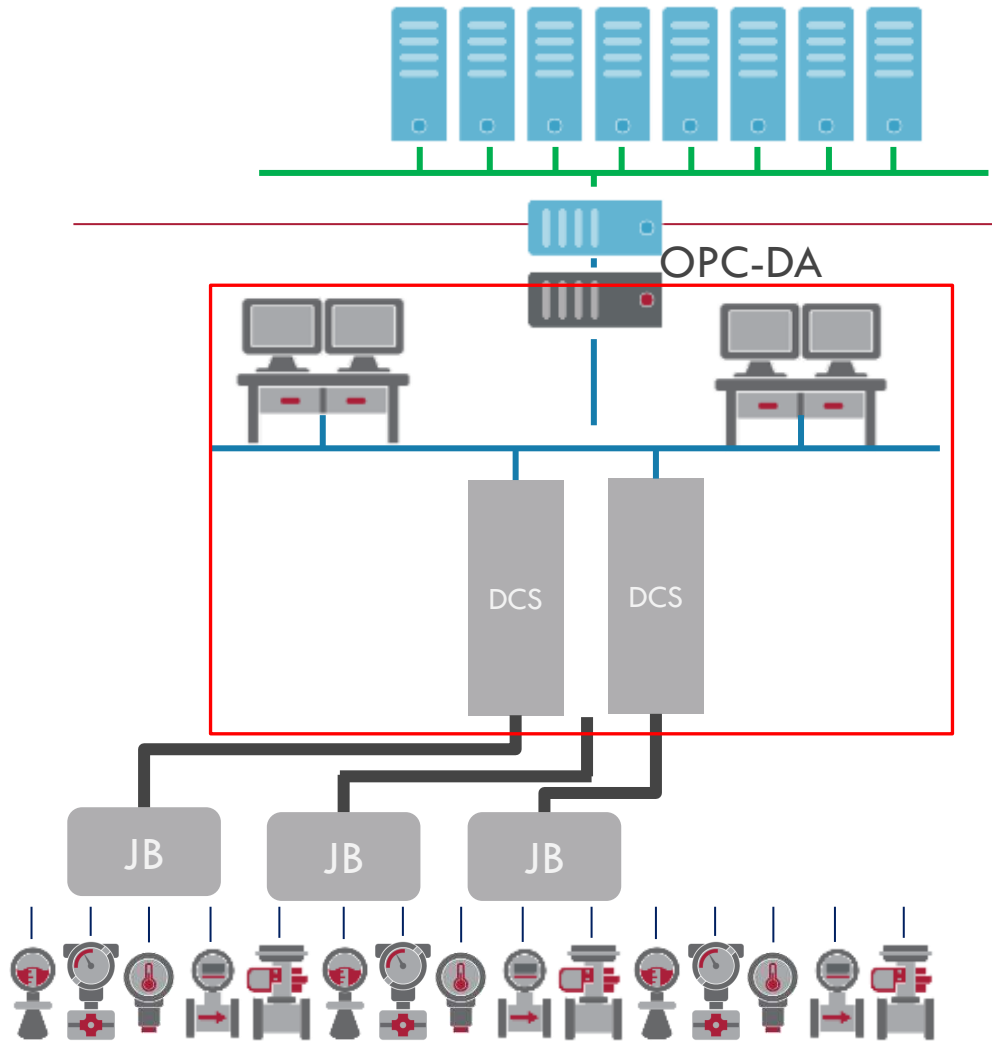
2023

+SAFETY

HART
APL Ethernet
10,000Kbps
2 wire
intrinsically safe

Let's Build DX ready plant NOW
Which also ready to Ethernet-APL era

Current typical plant

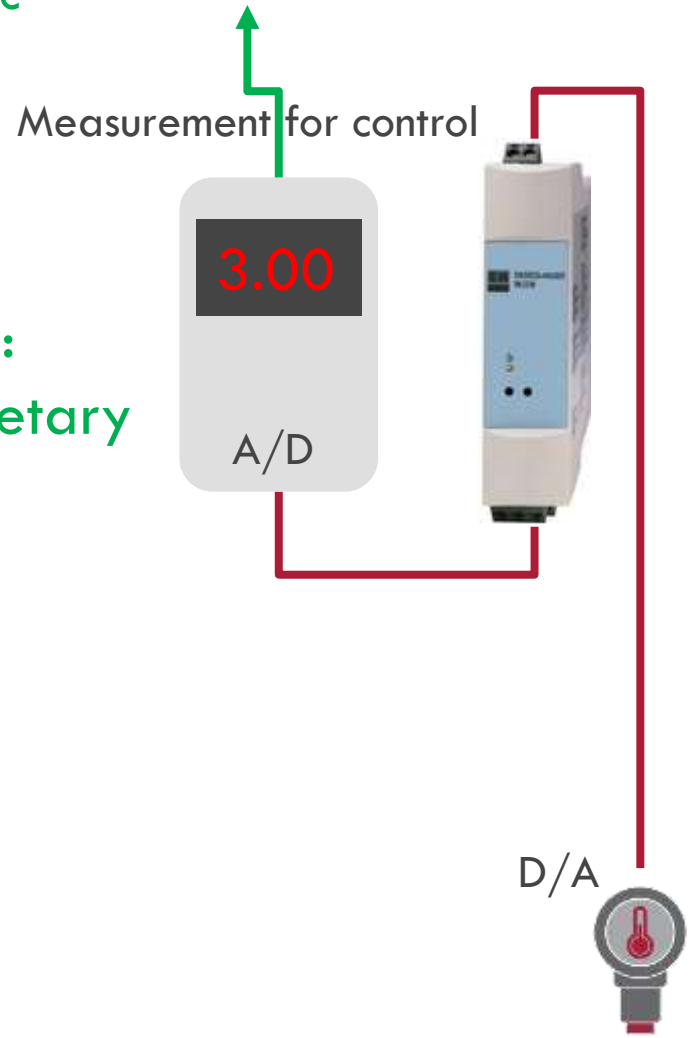


Data: App Specific
Ethernet

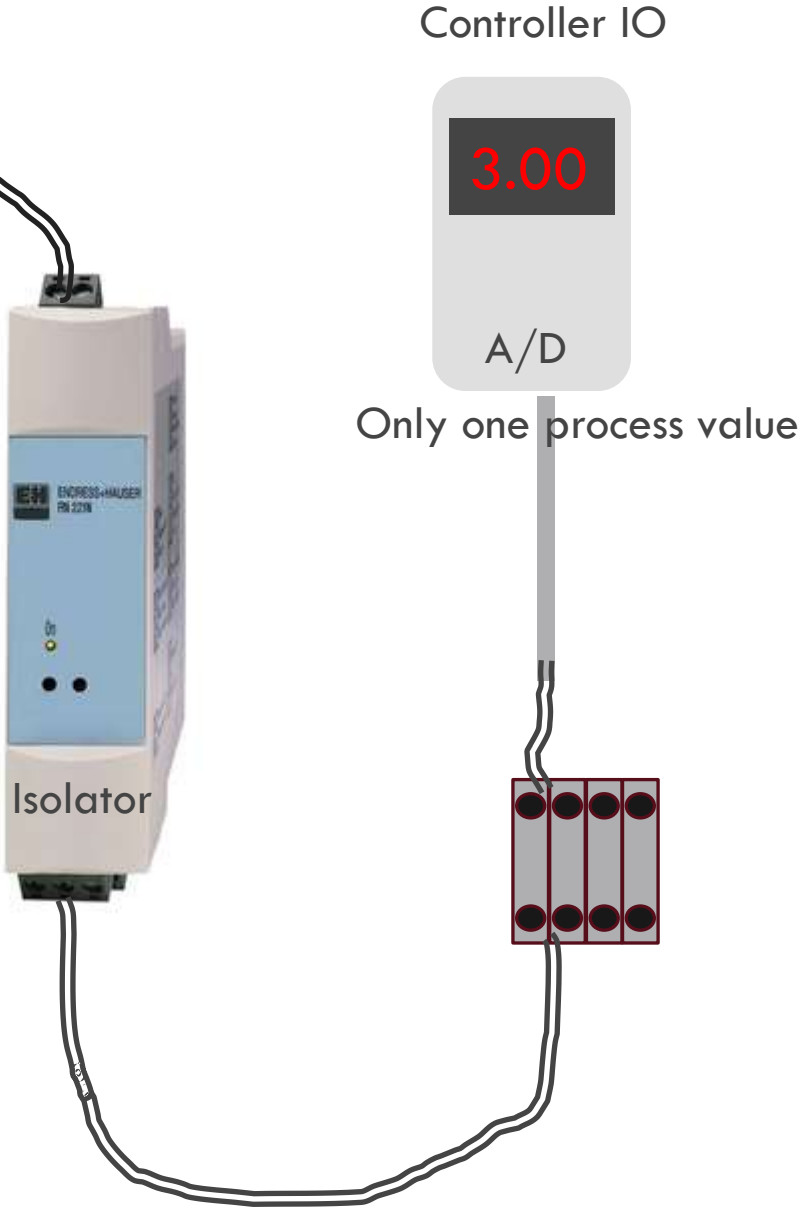
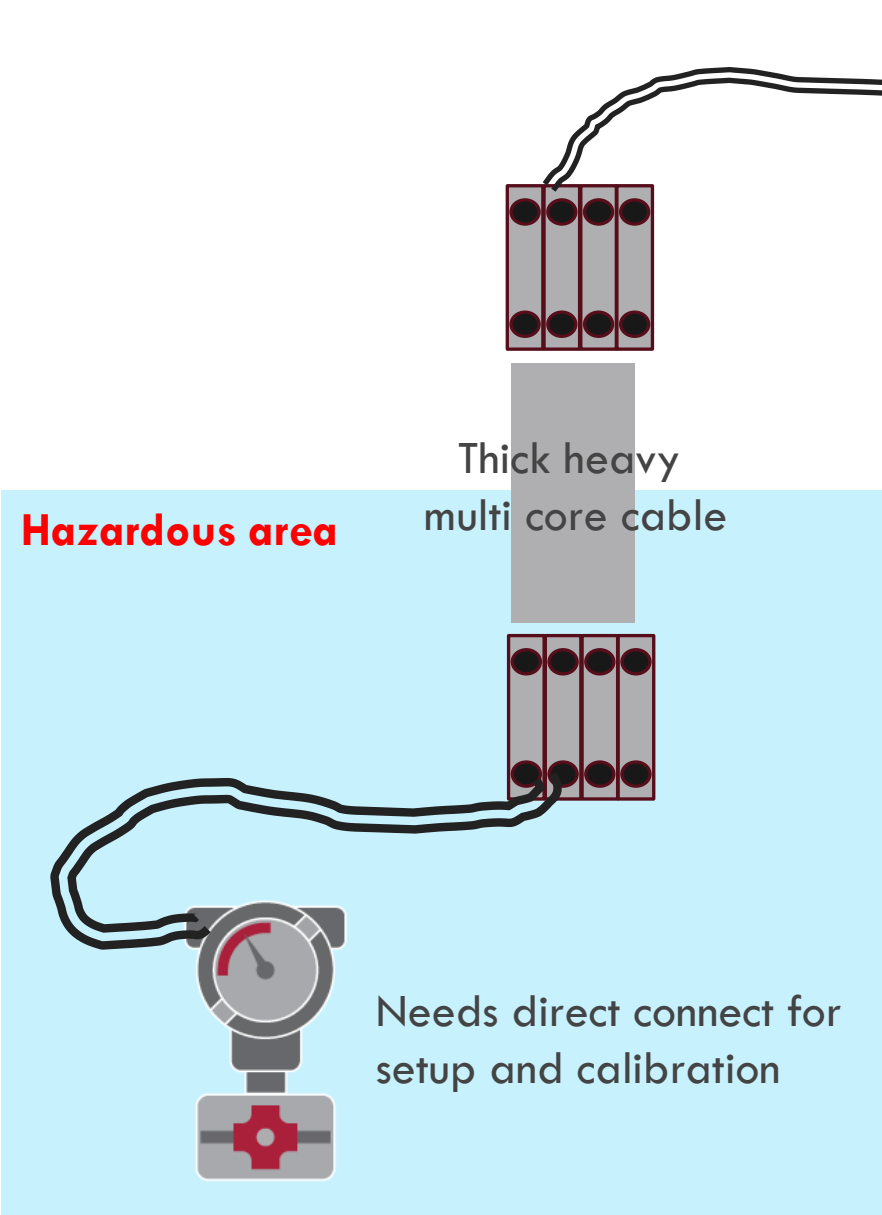
Control system:
Vender proprietary

4-20mA

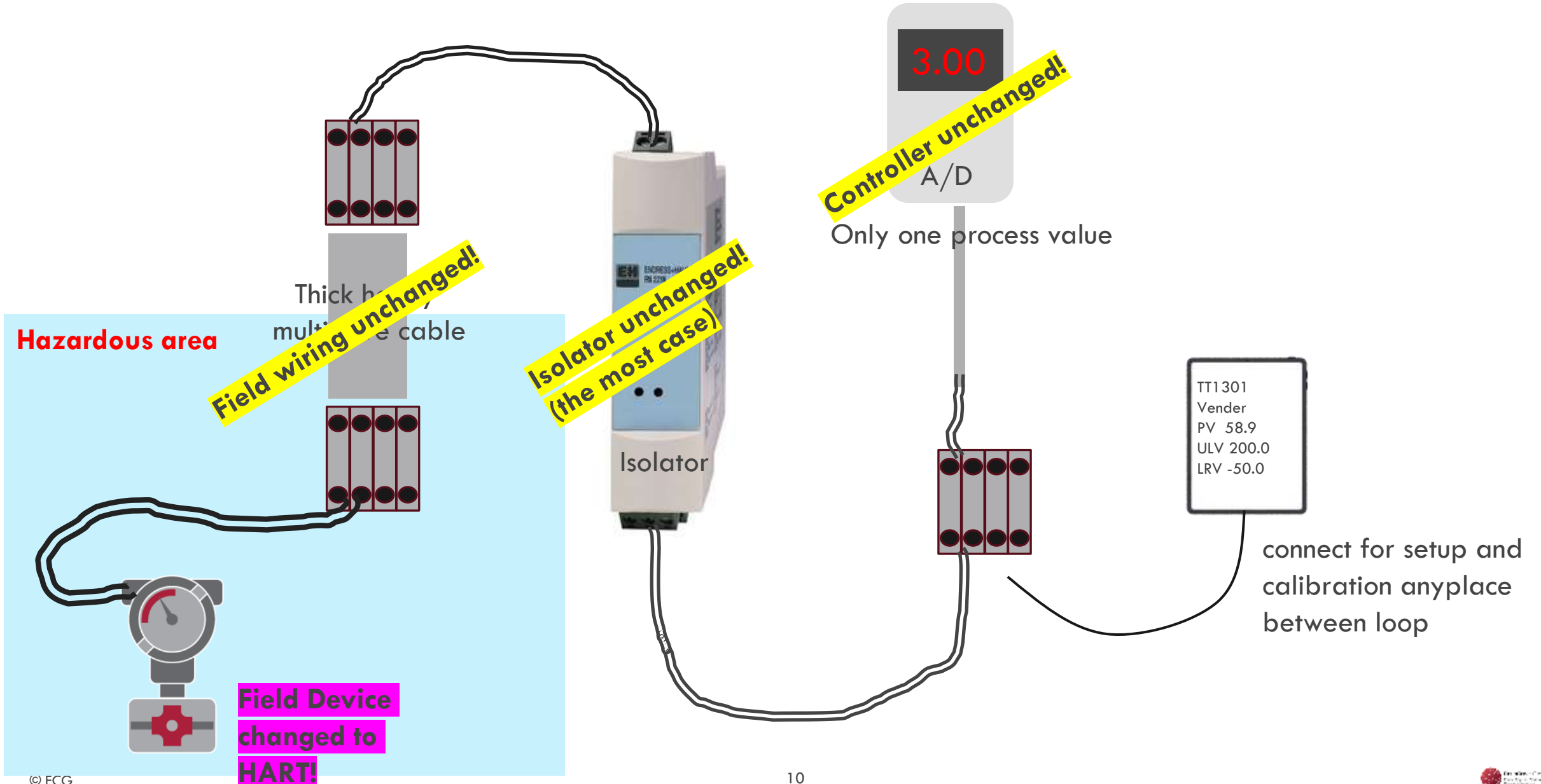
Typical loop structure



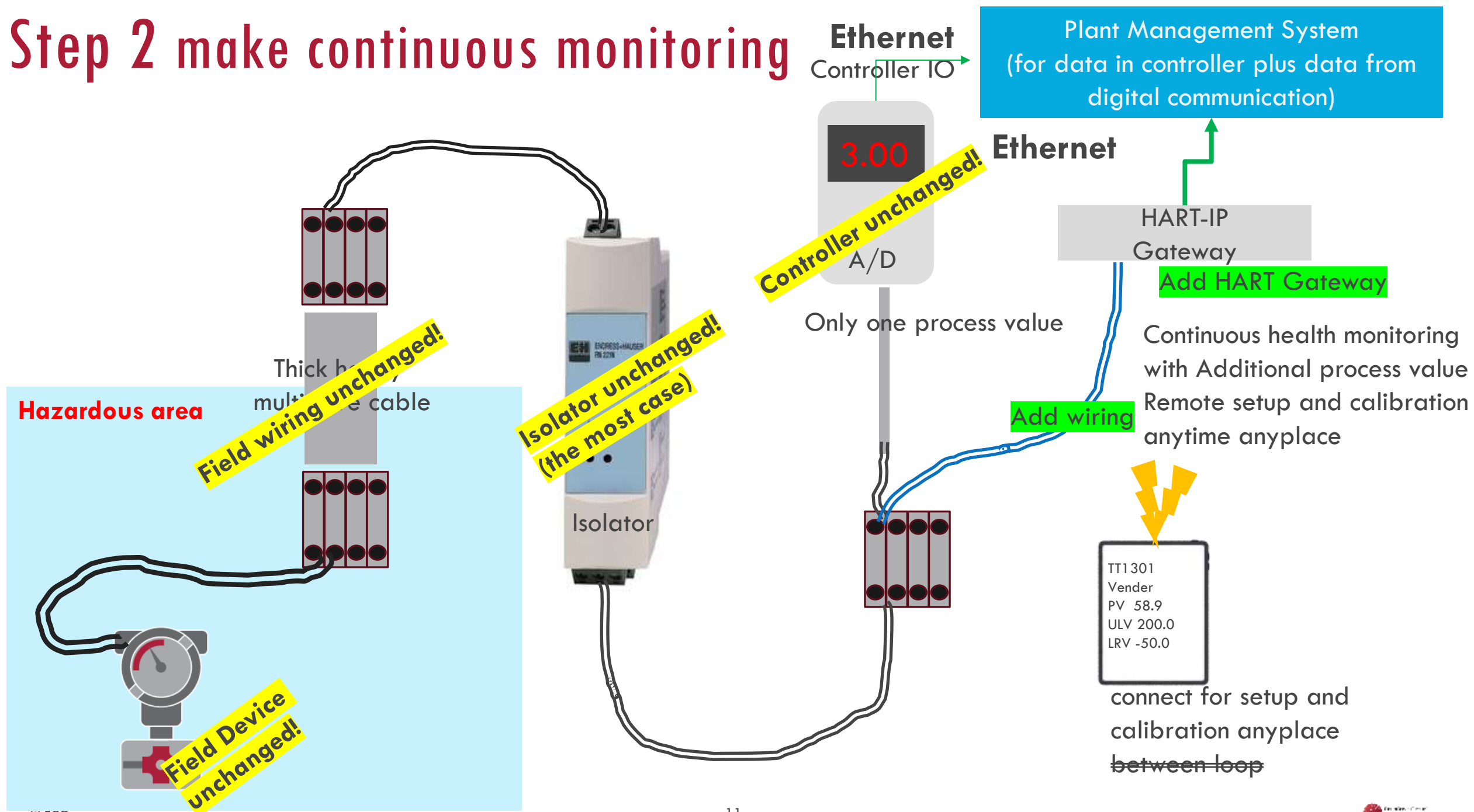
Step 0 current (past)



Step 1 change device to HART



Step 2 make continuous monitoring



Hazardous area

Thick bundle of multi-core cable

Field wiring unchanged!

Field Device unchanged!

**Isolator unchanged!
(the most case)**

Controller unchanged!

Plant Management System
(for data in controller plus data from digital communication)

Ethernet

HART-IP Gateway

Add HART Gateway

Only one process value

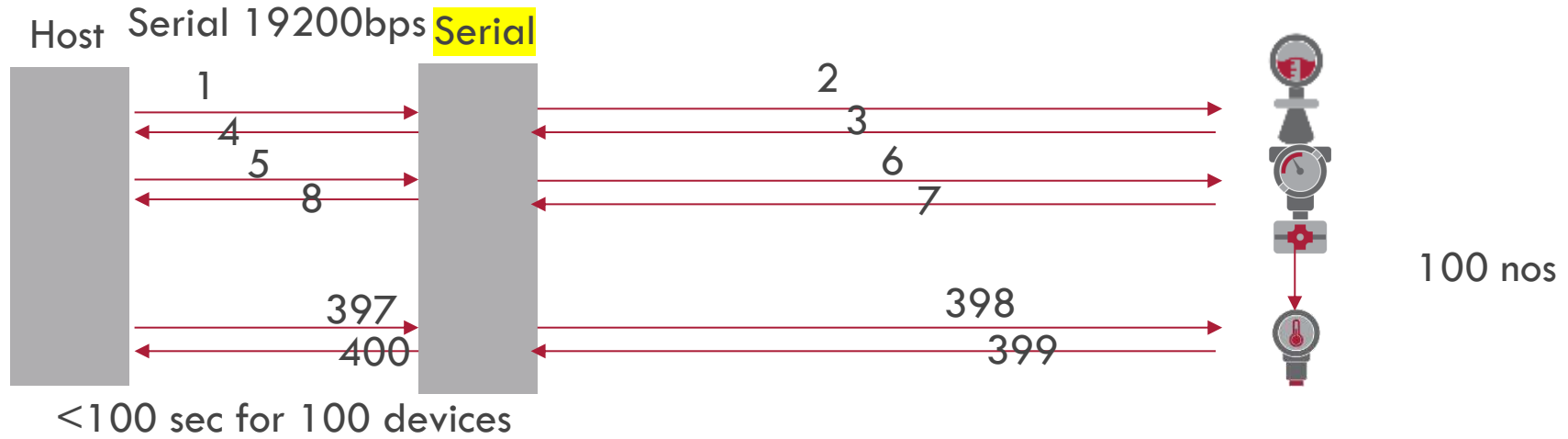
Add wiring

Continuous health monitoring with Additional process value Remote setup and calibration anytime anyplace

TT1301
Vender
PV 58.9
ULV 200.0
LRV -50.0

connect for setup and calibration anyplace between loop

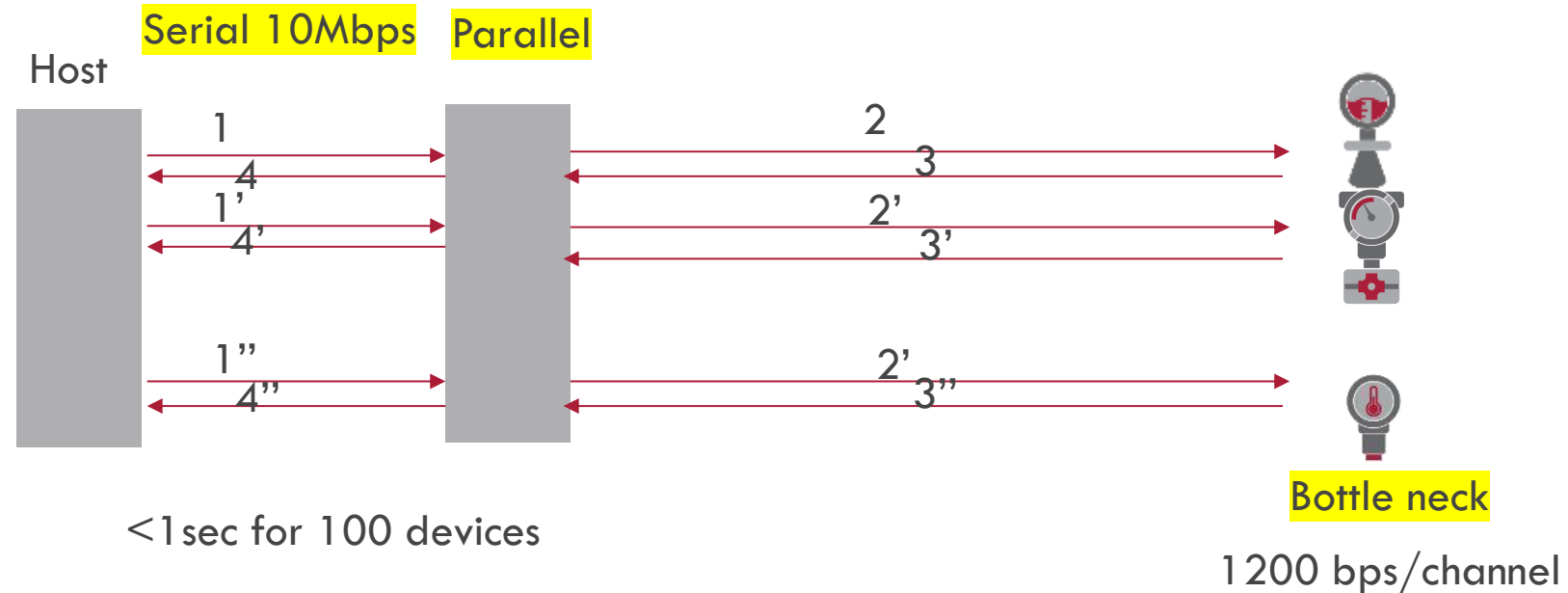
RS485 base HART multiplexer



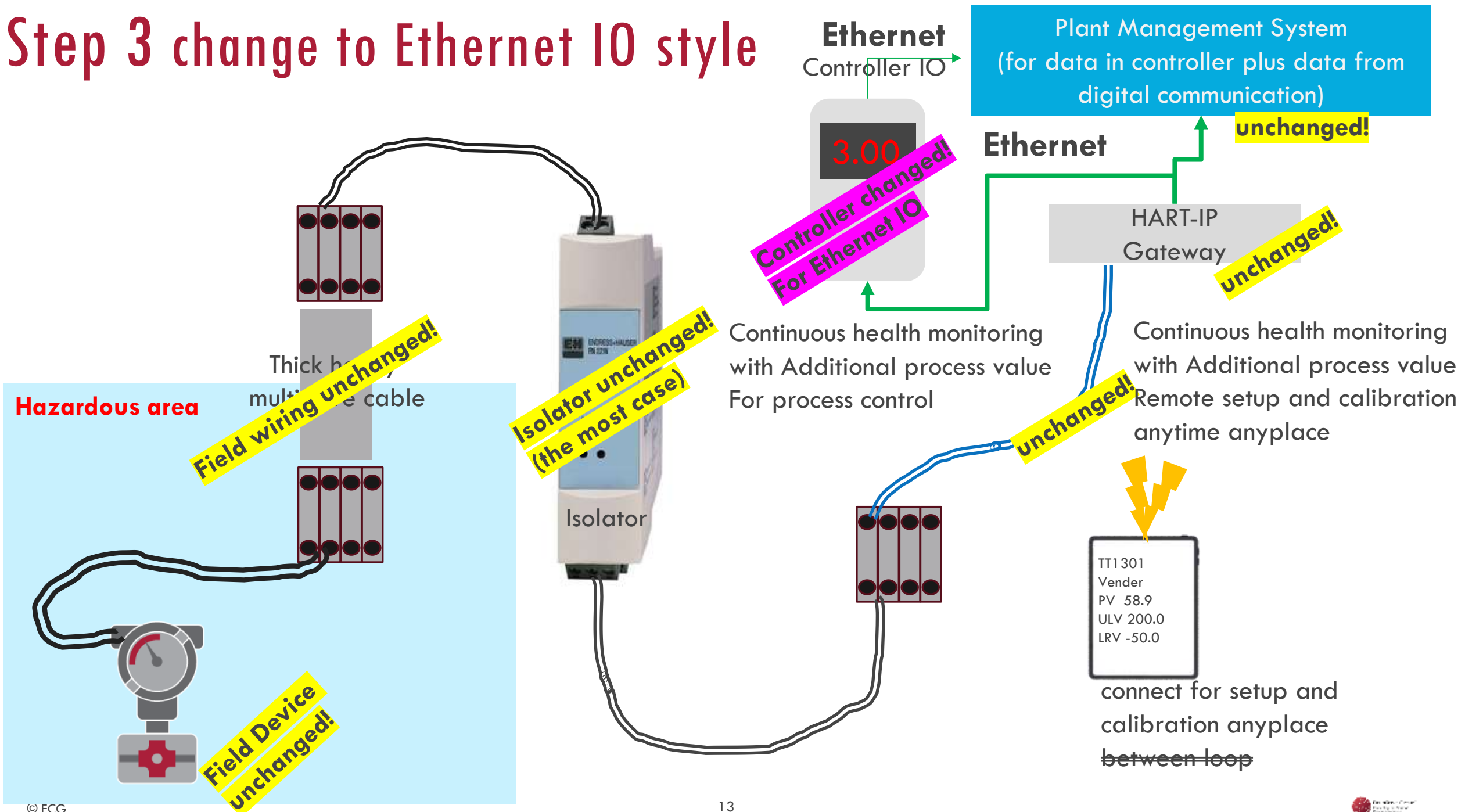
Bottle neck

$$1200 \text{ bps} / 100 \text{ channel} = 12 \text{ bps/channel}$$

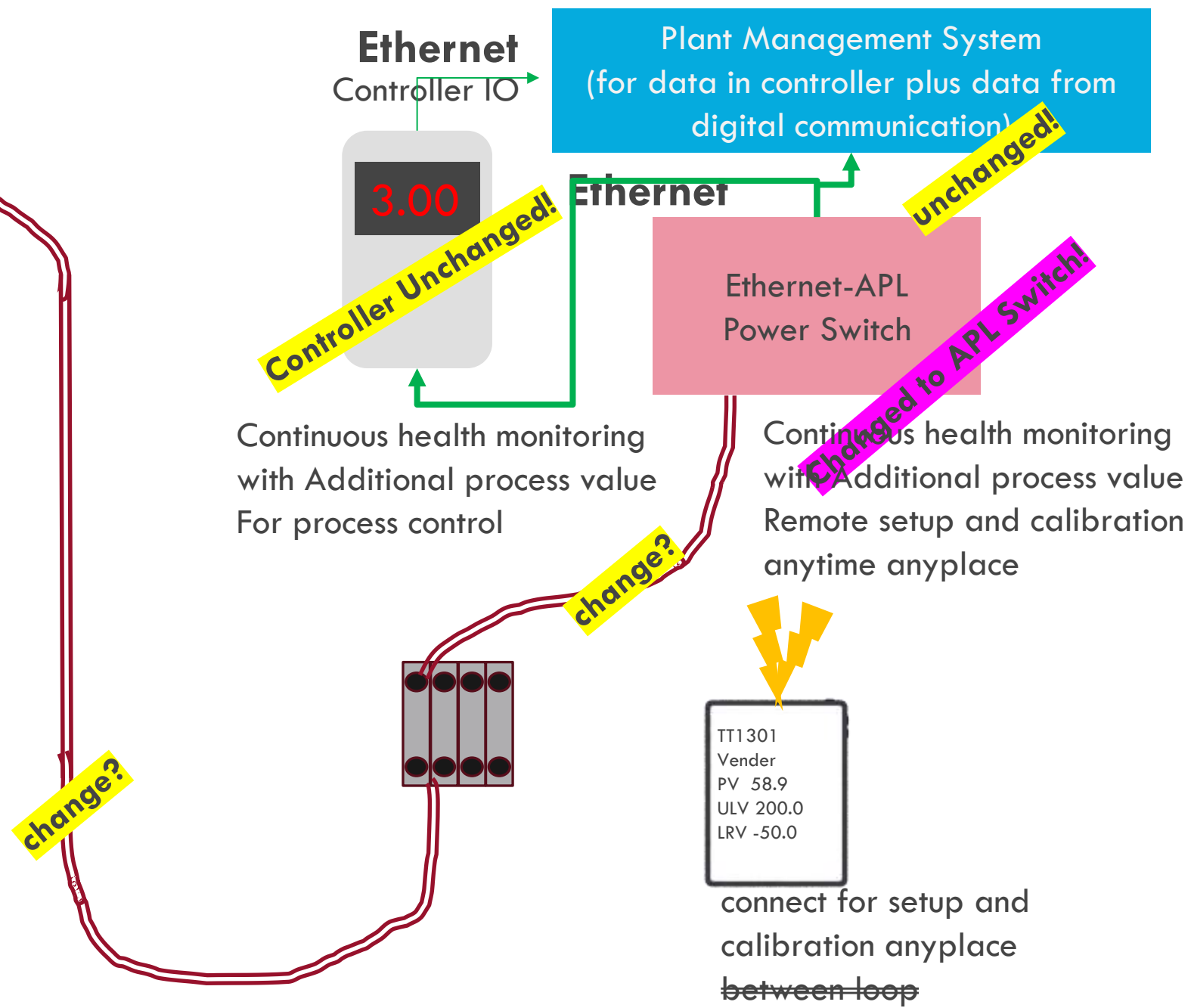
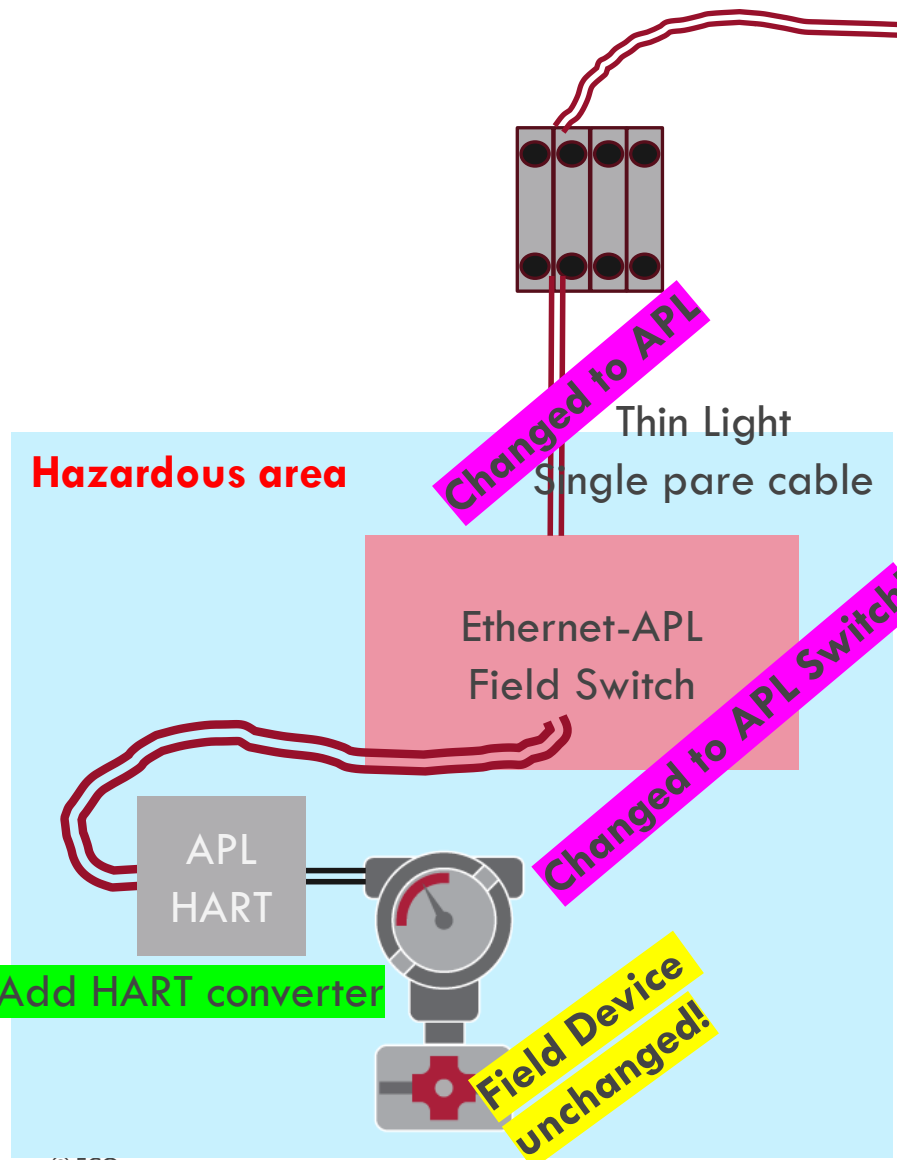
HART-IP Gateway



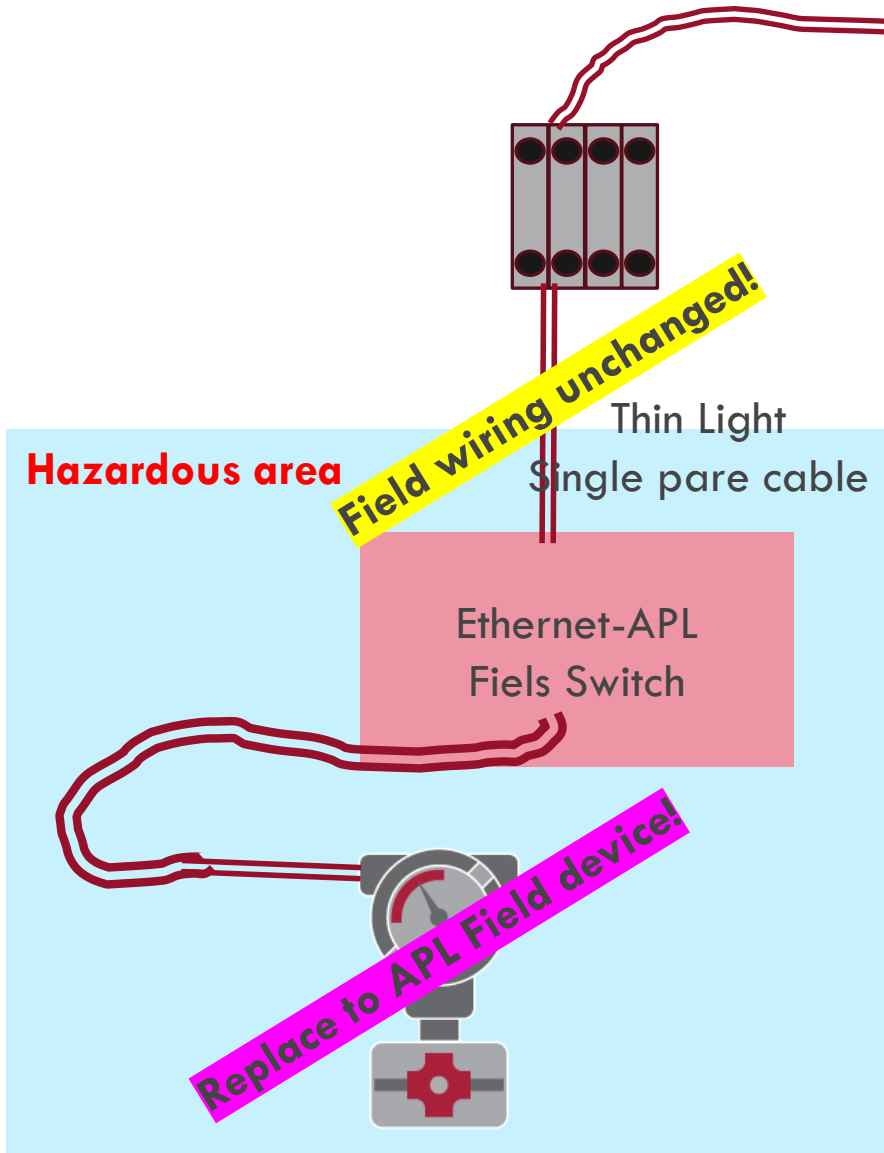
Step 3 change to Ethernet IO style



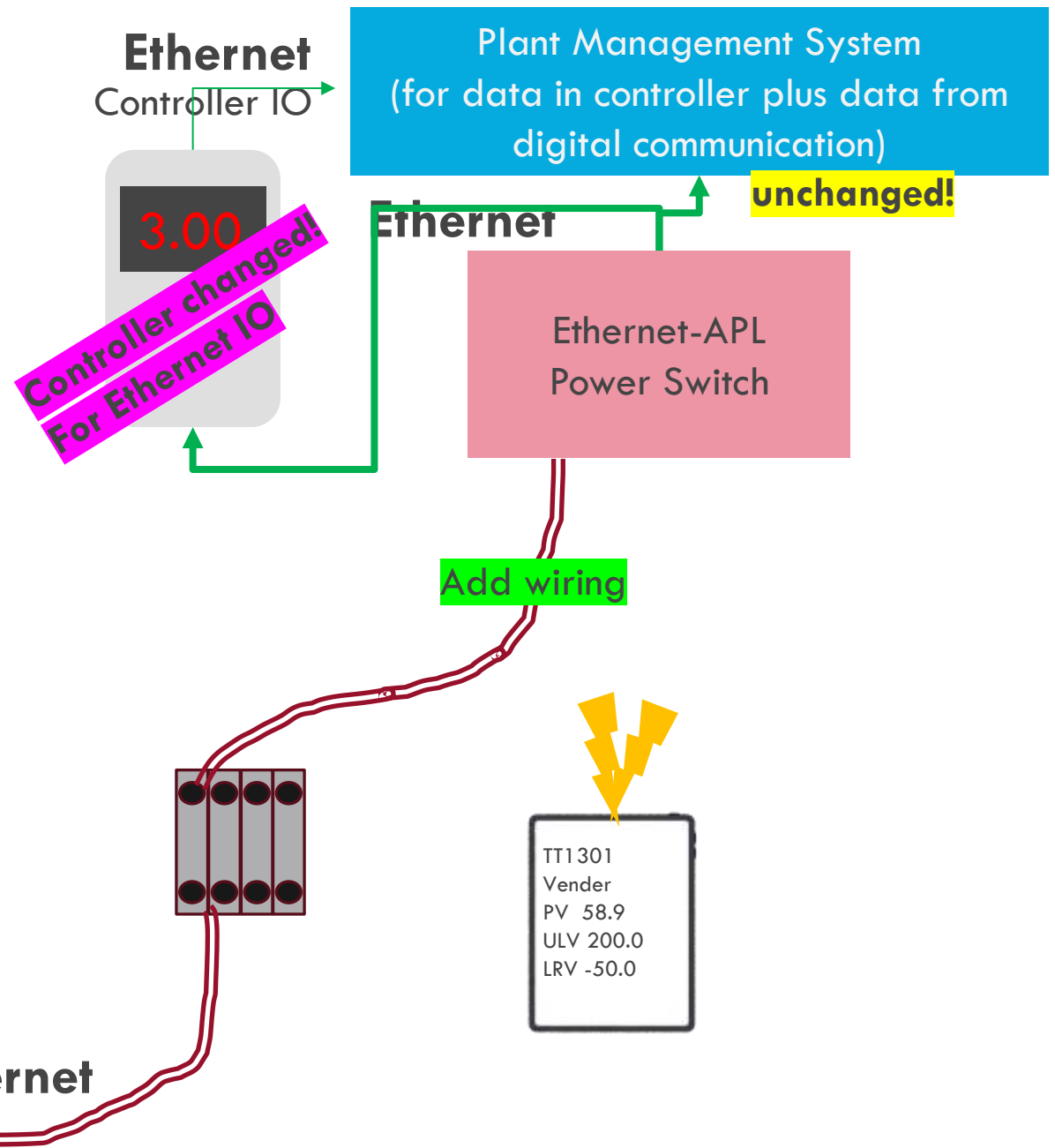
Step 4 use to APL



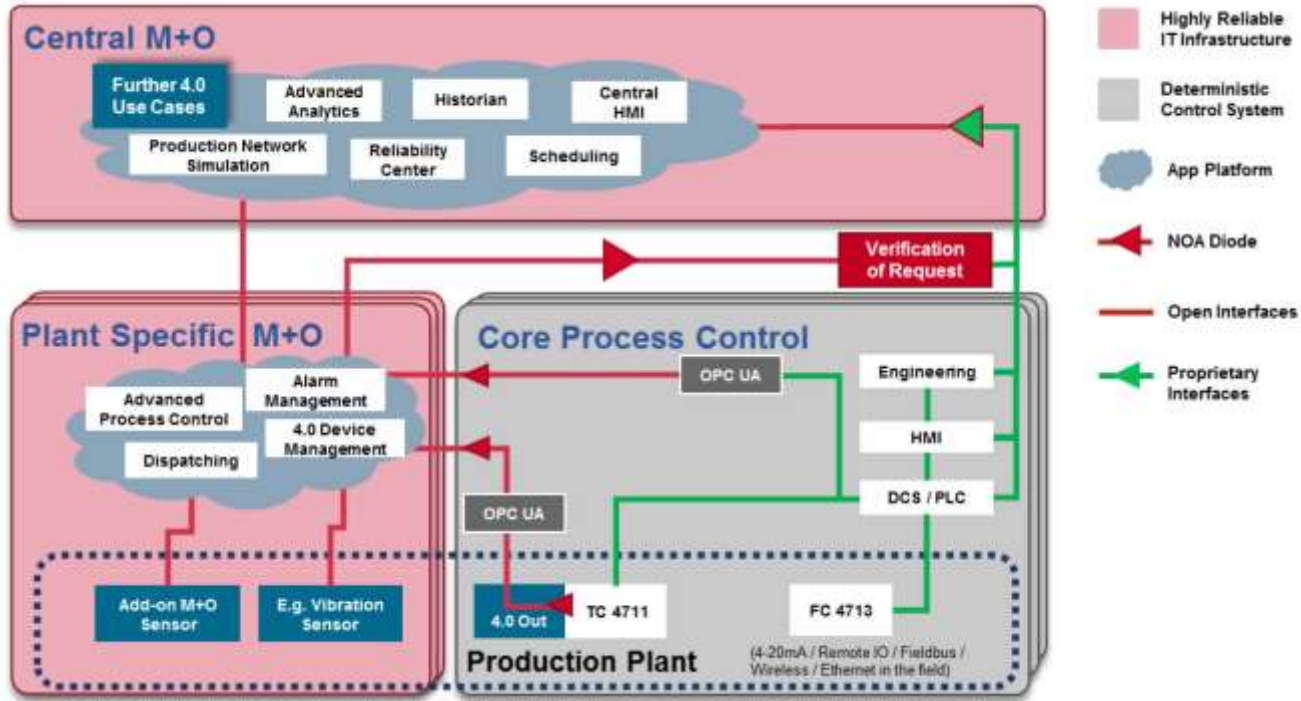
Step 5 change Ph HART to APL



Not necessary



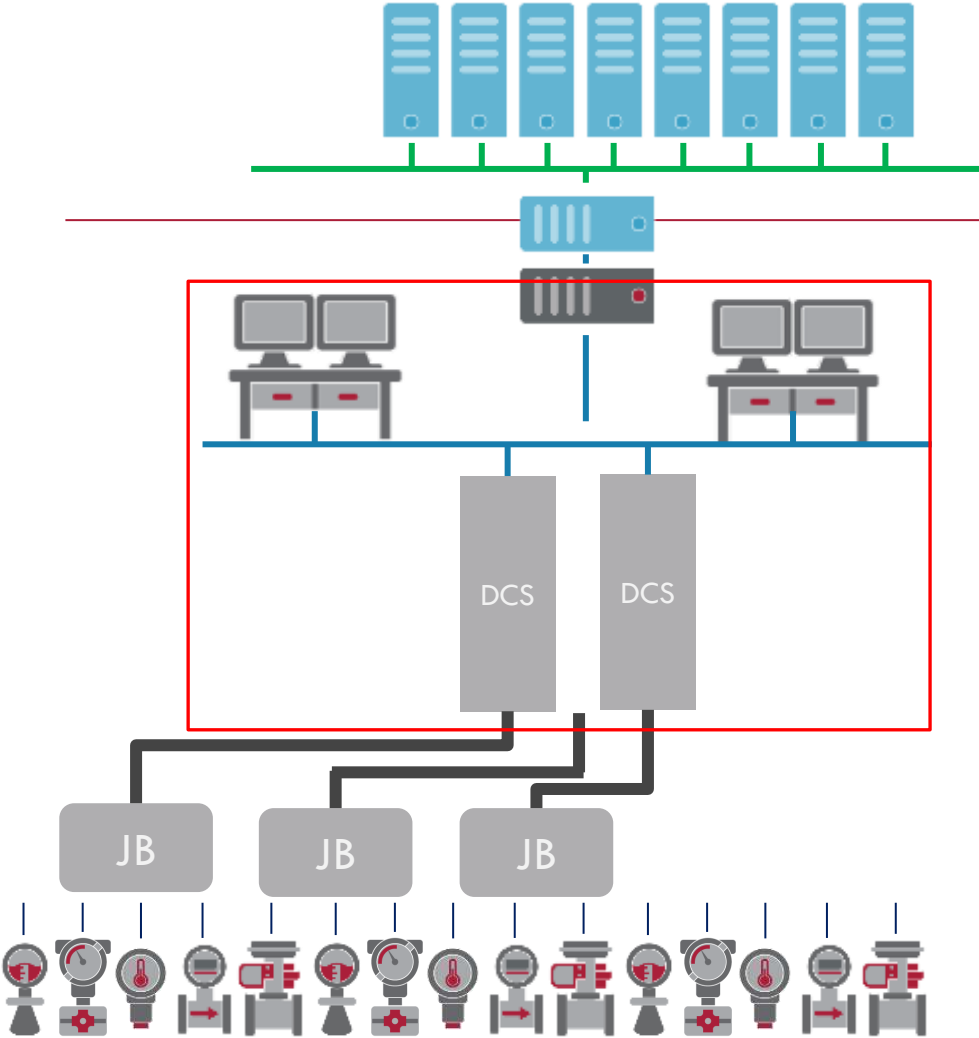
Monitoring and Optimization (M+O)



Evolution easy

When Control system change
Your investments are protected since
standard and separated system

Current typical plant



5-10year

5-10year

10-20year

25-50year ~Decommission

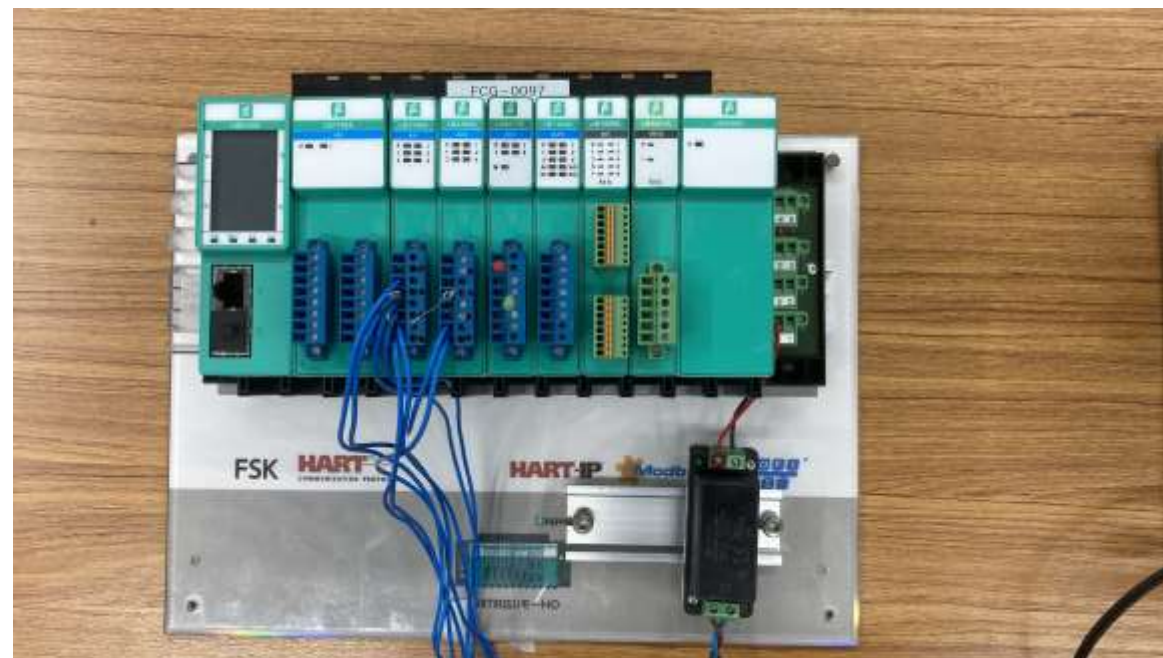
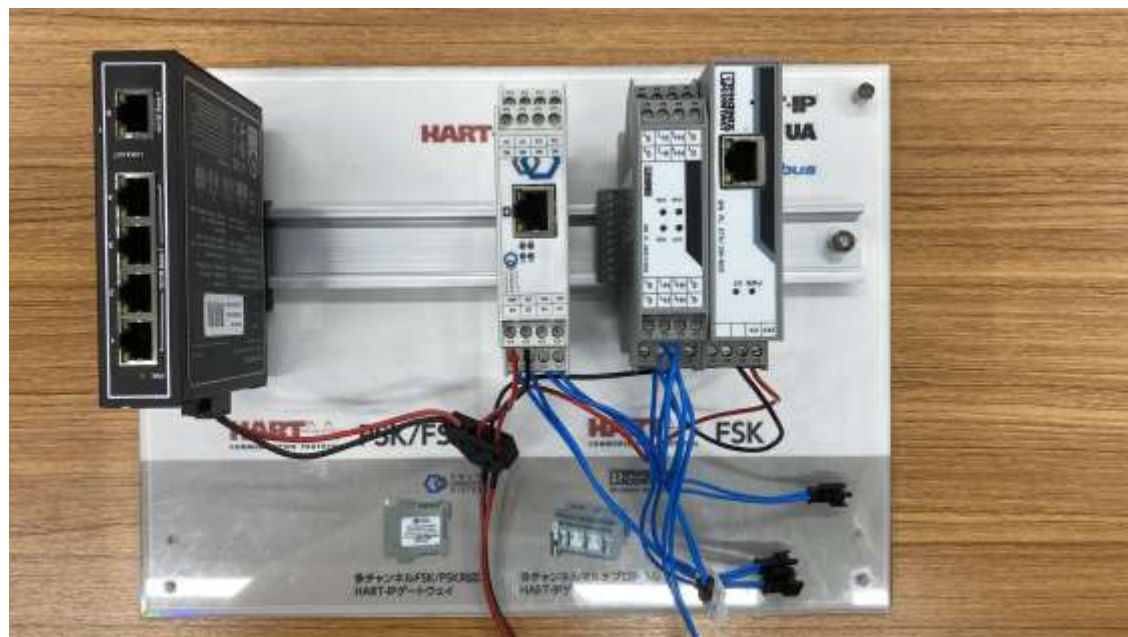
15-25year Update to Decommission

Big event (loss) at replacement for update

Keep using

Keep using

Multi protocol HART-IP gateway is already here





Special thanks to

Waseda university (Industrial open network Laboratory),
FieldComm Group Japan
and KMITL for demo configuration

Equipment donated to Waseda by below company





THANK YOU FOR LISTENING
ご静聴ありがとうございました
ขอขอบคุณสำหรับการฟัง