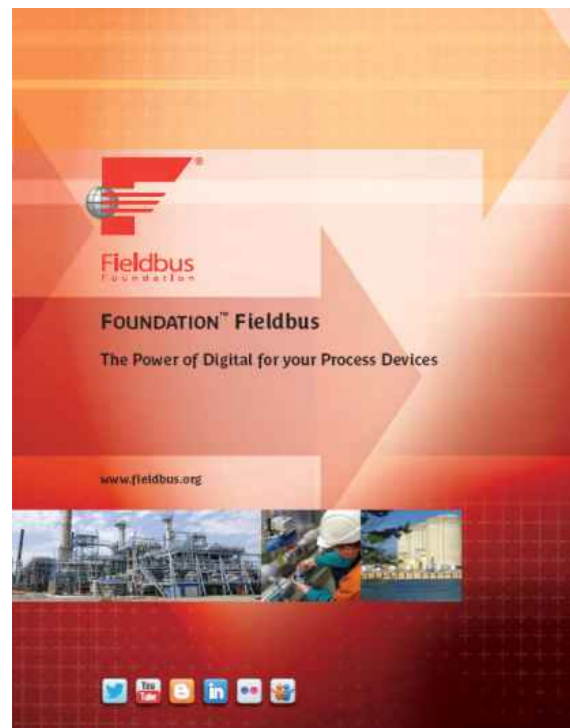




Proven Benefits in Projects Worldwide





Topics Covered

- Reduced hardware requirements
- Smaller system footprint
- Reduced device count
- An open network standard
- Faster commissioning





Reduced Hardware Requirements

Performing functions in software reduces the need for hardware

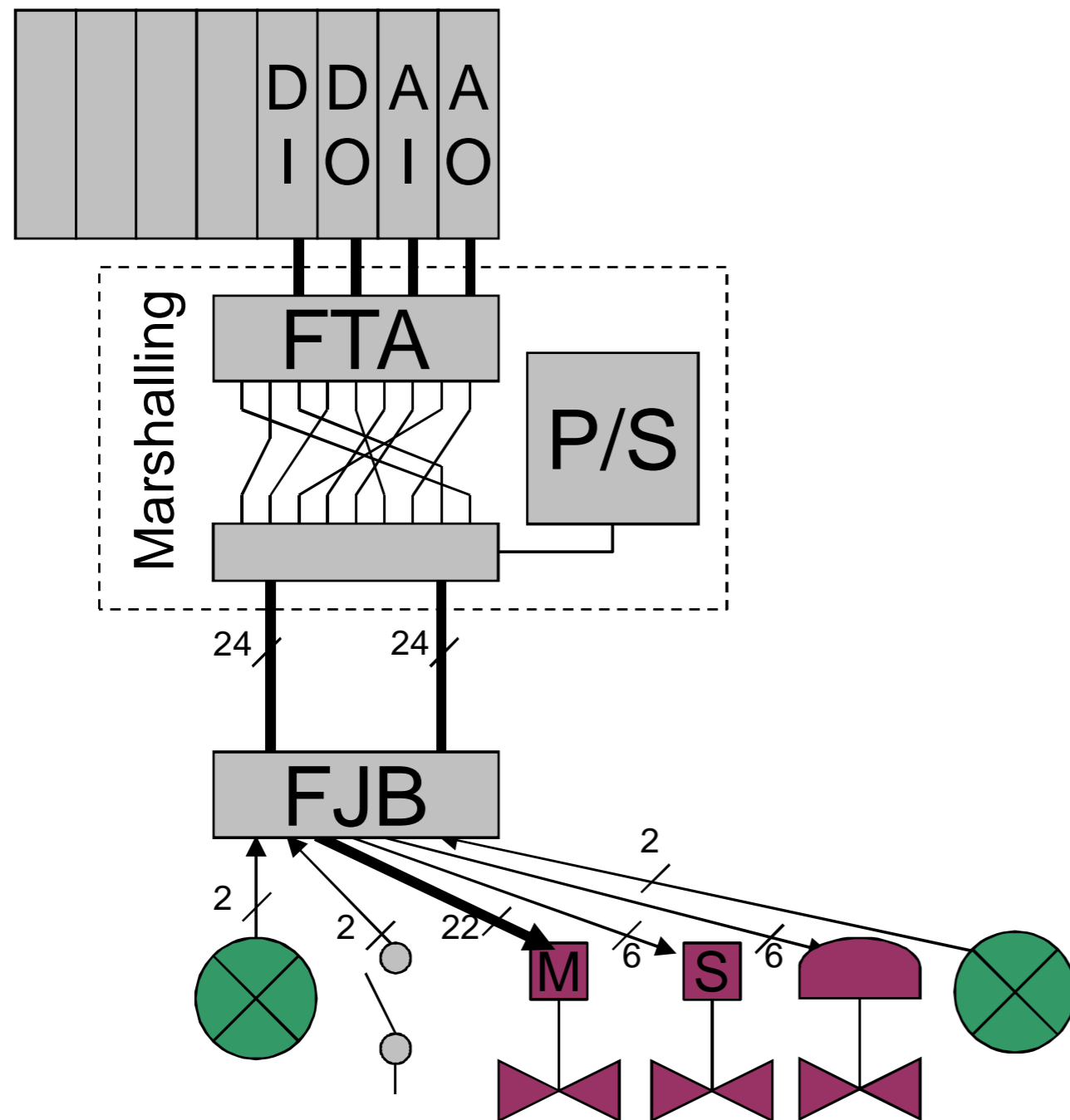




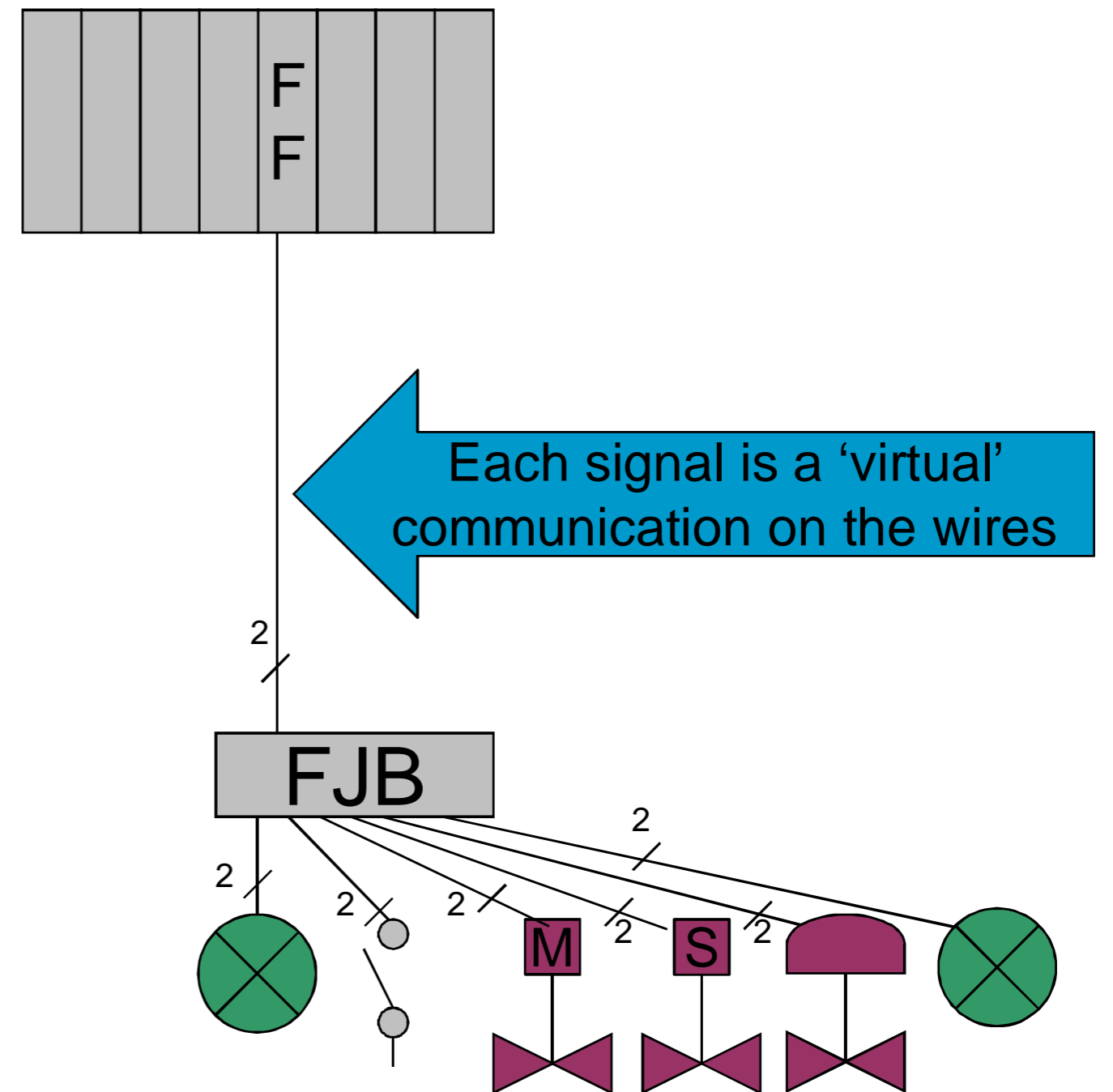
Eliminate Physical Signal Marshalling

- Signal marshalling handled through software instead of hardware

Hardwired



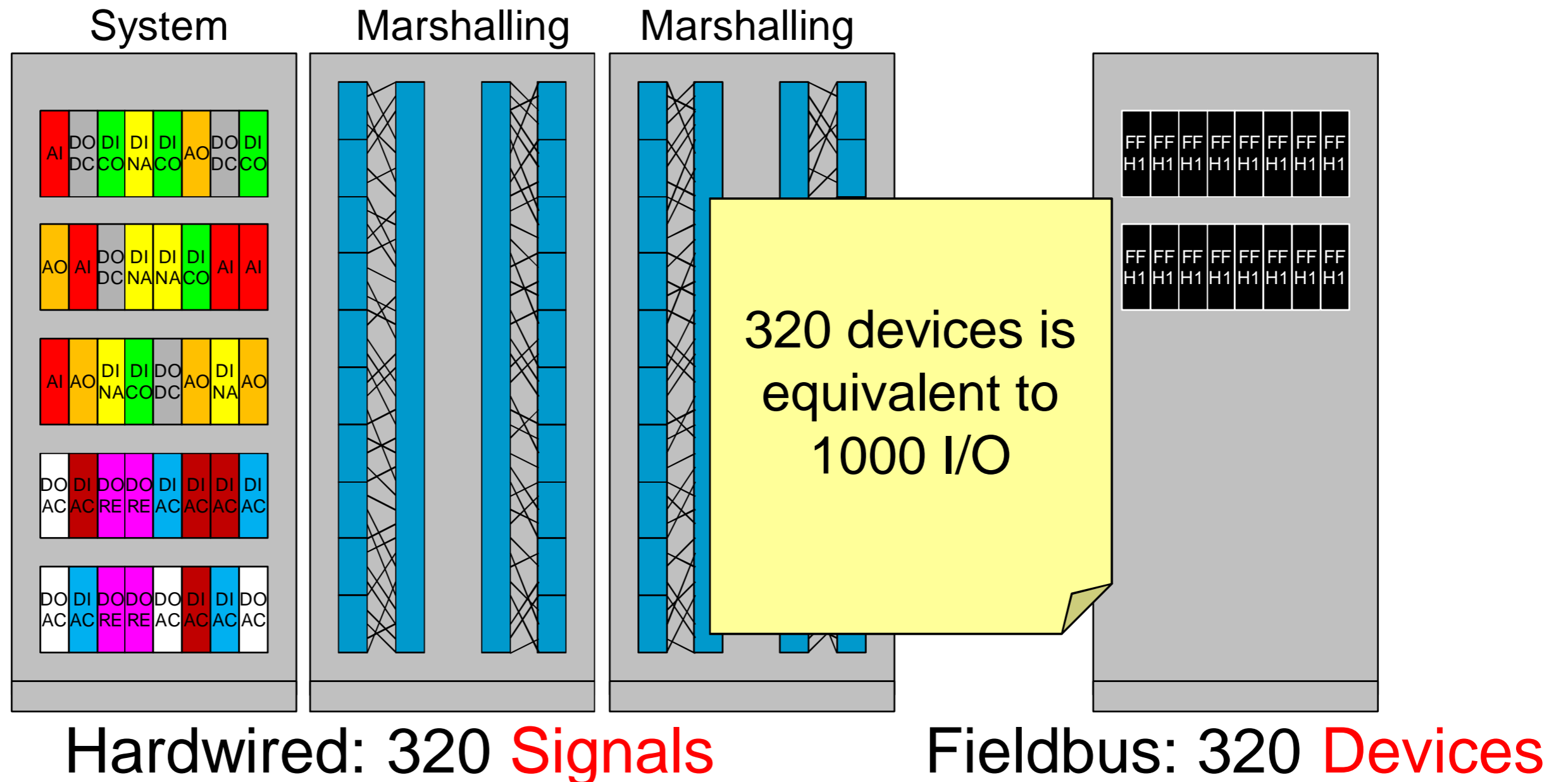
Fieldbus





Networking Instead of I/O Cards and Marshalling

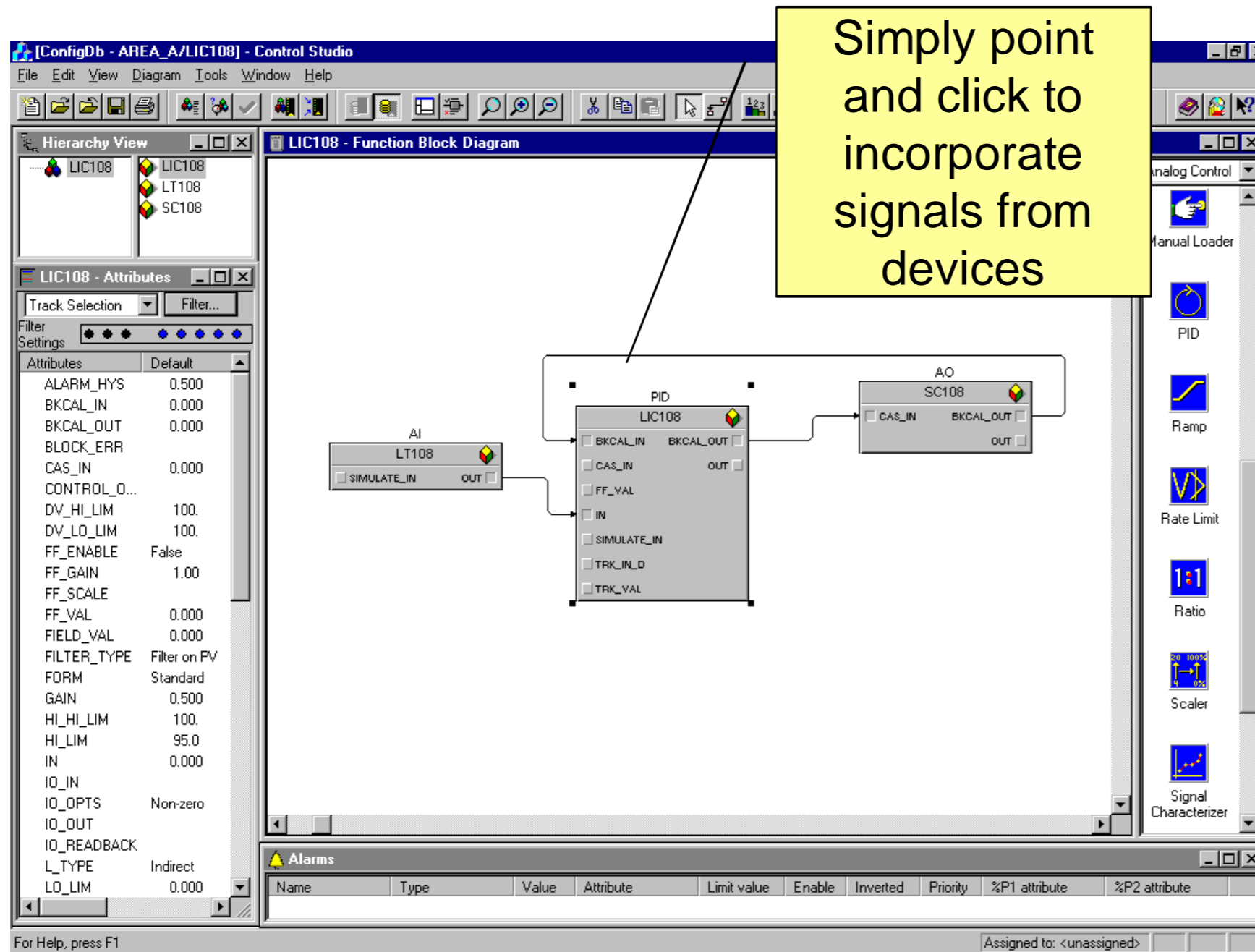
- The smallest hardware footprint of any technology in process automation
- Significantly reducing the overall amount of equipment needed





VirtualMarshalling™ — Software-based Distributed I/O Connectivity

- All signal linking (block to block) is done in software without hardwiring

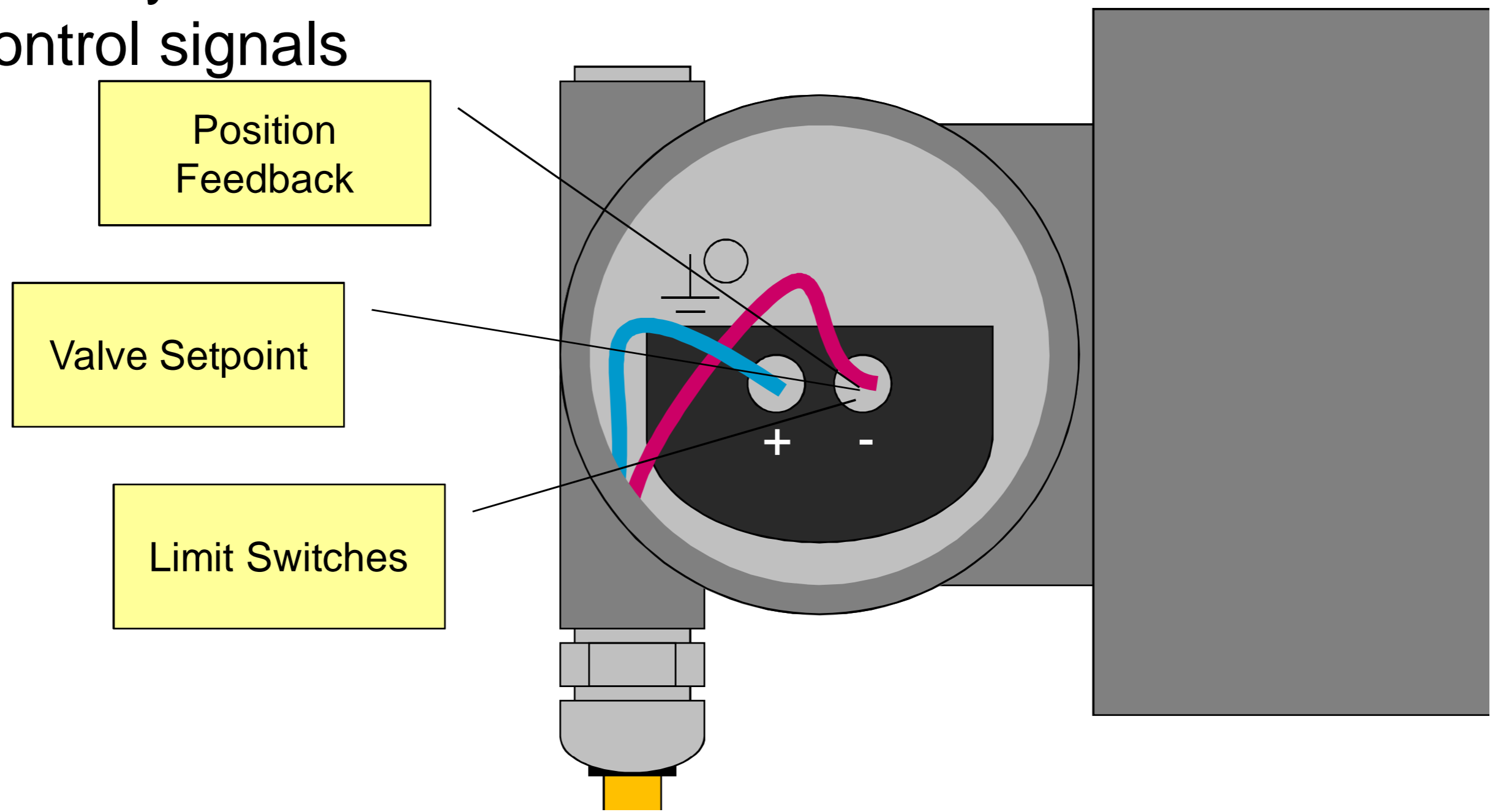


Flexibility
Using additional device signals does not require more cable, terminals, barriers, I/O channels, or power etc.



Easy to Make Late Changes in the Project

- Integrate additional signals from devices without additional wiring or I/O count:
 - Feedback
 - Auxiliary measurements
 - Control signals





Change Device without Reshuffling I/O Cards or Rerouting Cable

- Instrument changes does not affect cabling or I/O subsystem design

Flexibility
Change the design to a kind of device with drastically different signals without redesigning the I/O

Fieldbus connection in all device types is the same

Control Valve



On/Off Valve



Electric Actuator (MOV)

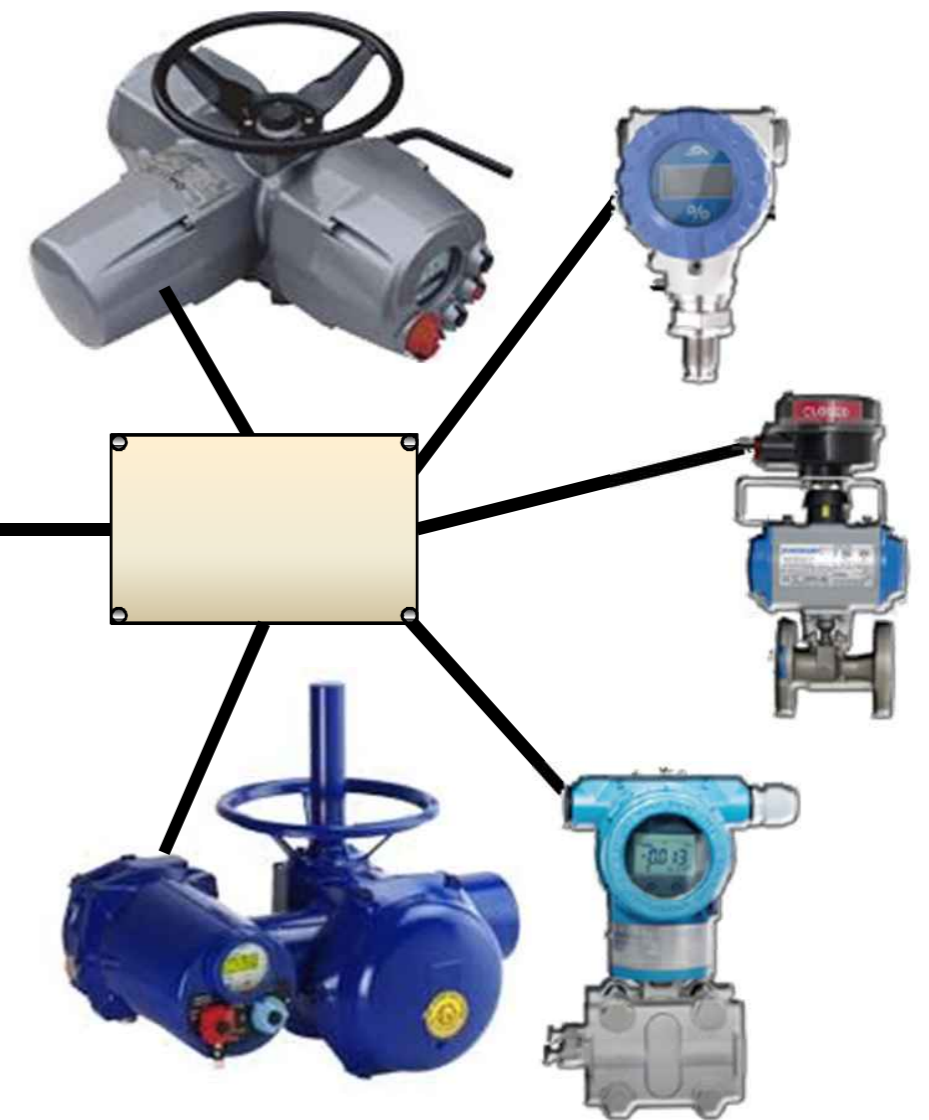




Add More Devices without Laying More Cable

Flexibility

Bus typically designed for 10 devices plus 2 spares, but up to 16 devices can often be loaded





Smaller System Footprint

Less hardware requires less
space

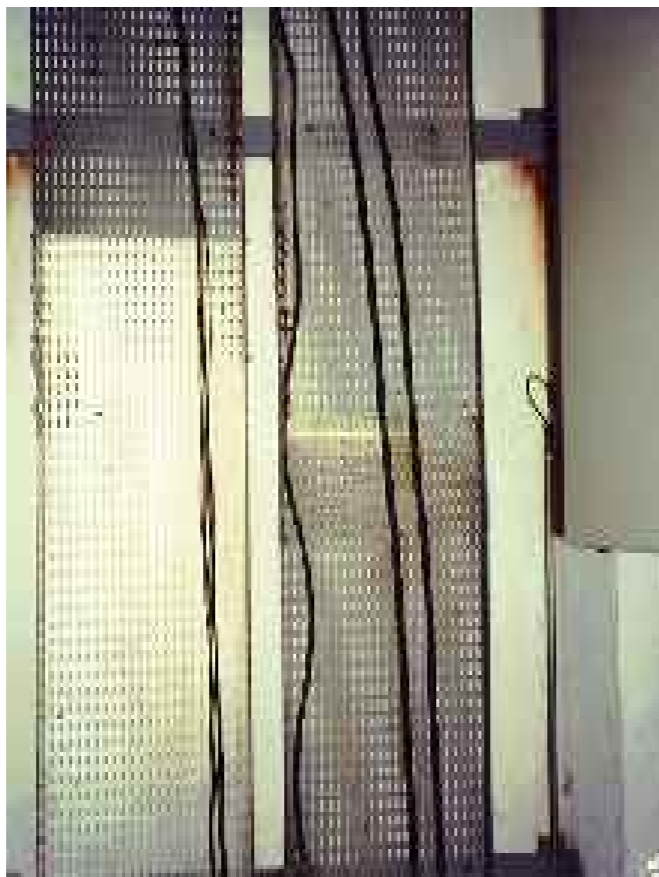


Reduced Hardware and Labor Cost

Hardwired



Fieldbus

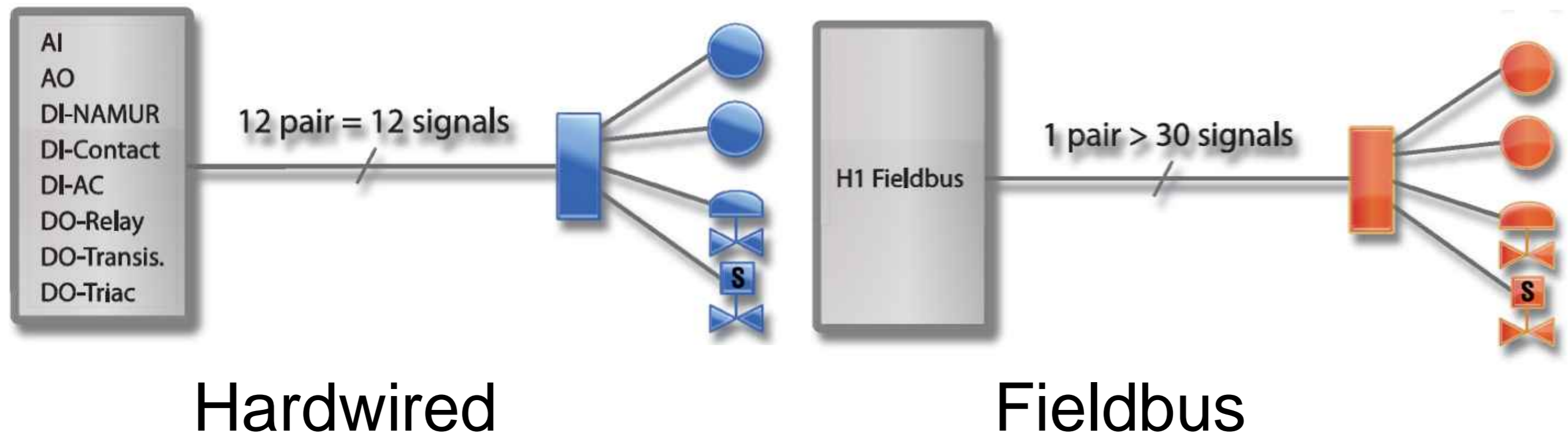


- Less hardware
 - Cable
 - Cable trays
 - I/O cards
- Less installation labor at every intermediate point
 - Cutting
 - Stripping
 - Crimping
 - Labeling
 - Connecting
- The resulting cost is even lower than remote I/O and local mounting



Example

- A bus with 10 instruments
- Average of three signals per device
- Can take the place of 30 pairs of wires and I/O channels





Simplifies Integration of Complex Devices with Multiple Signals

- **Hardwired**

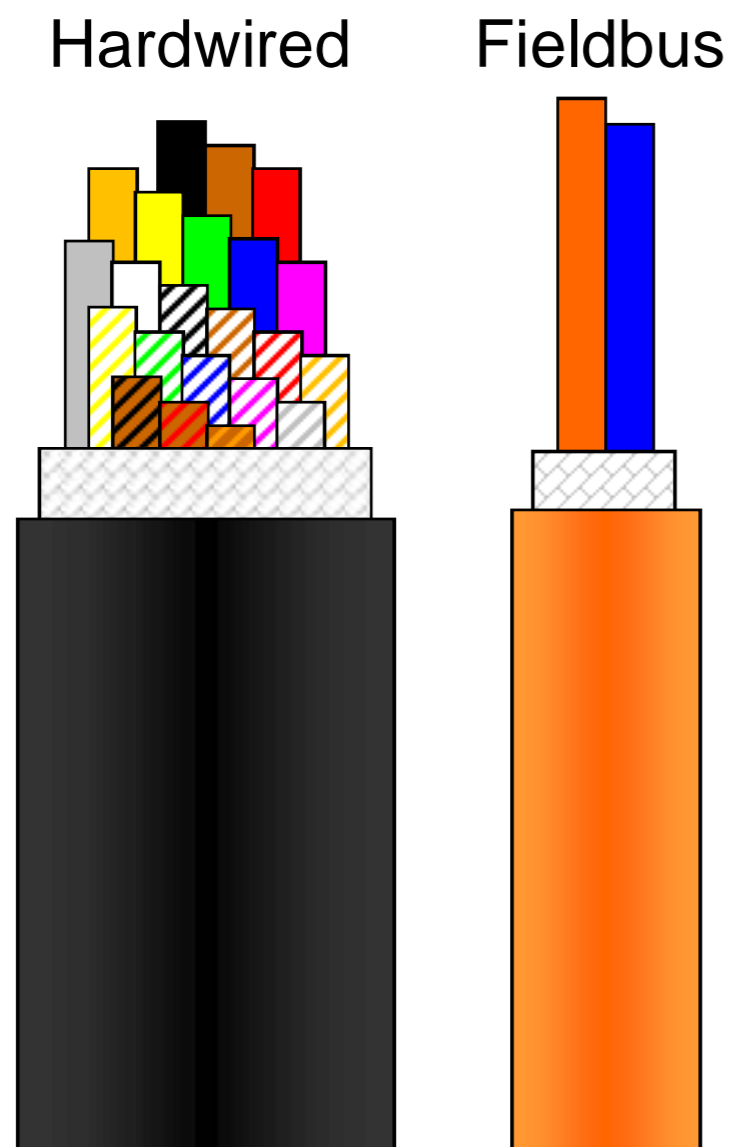
- 1 pair of wires and one I/O channel per signal
- 3, 6, 12 or more signals per device

- **Fieldbus**

- A single pair of wires to support multiple devices
- Multiple auxiliary signals per device

- **Reduction:**

- Wiring
- I/O cards
- I/O cabinets
- Footprint
- Weight
- Labor





Fully Utilize Device Capabilities

- Every device signal can now be employed at low cost
 - No longer limited to a subset of signals and functionality
- For example:
 - Continuous feedback for all valves

Hardwired system may only afford to use 6 out of 16 signals – only basic functionality

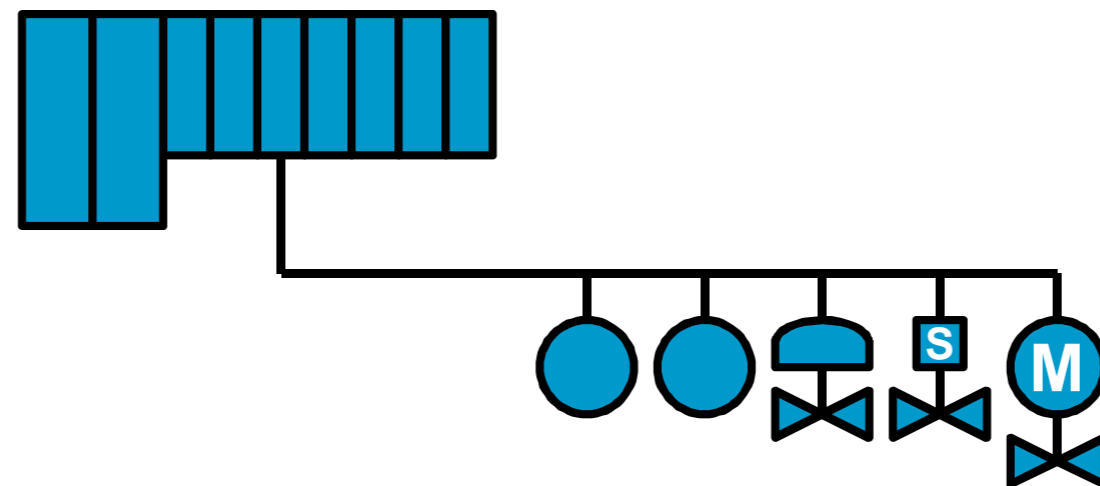


Cores	I/O	Description
4	3 DO	Open/stop/close control
2	1 AO	Desired valve position control
2	1 DO	Emergency shut down
3	2 DI	Valve position status (limit switches)
2	1 AI	Percentage open
1	1 DI	Available for control
1	1 DI	Local/remote switch
1	1 DI	Motor running open direction
1	1 DI	Motor running closed direction
1	1 DI	Torque switch tripped
2	1 AI	Percentage torque
1	1 DI	Motor thermostat tripped
1	1 DI	Battery condition low
22	16 ch	TOTAL



Simpler Component Selection

- Inputs and outputs; analog and discrete, share the same bus:
 - Transmitters, control valves, and two-wire on/off valves etc. together
- No need to select I/O card type
- No need to select barrier type
- All fieldbus devices use the same single type of interface card and barrier
- All devices have the same entity parameters



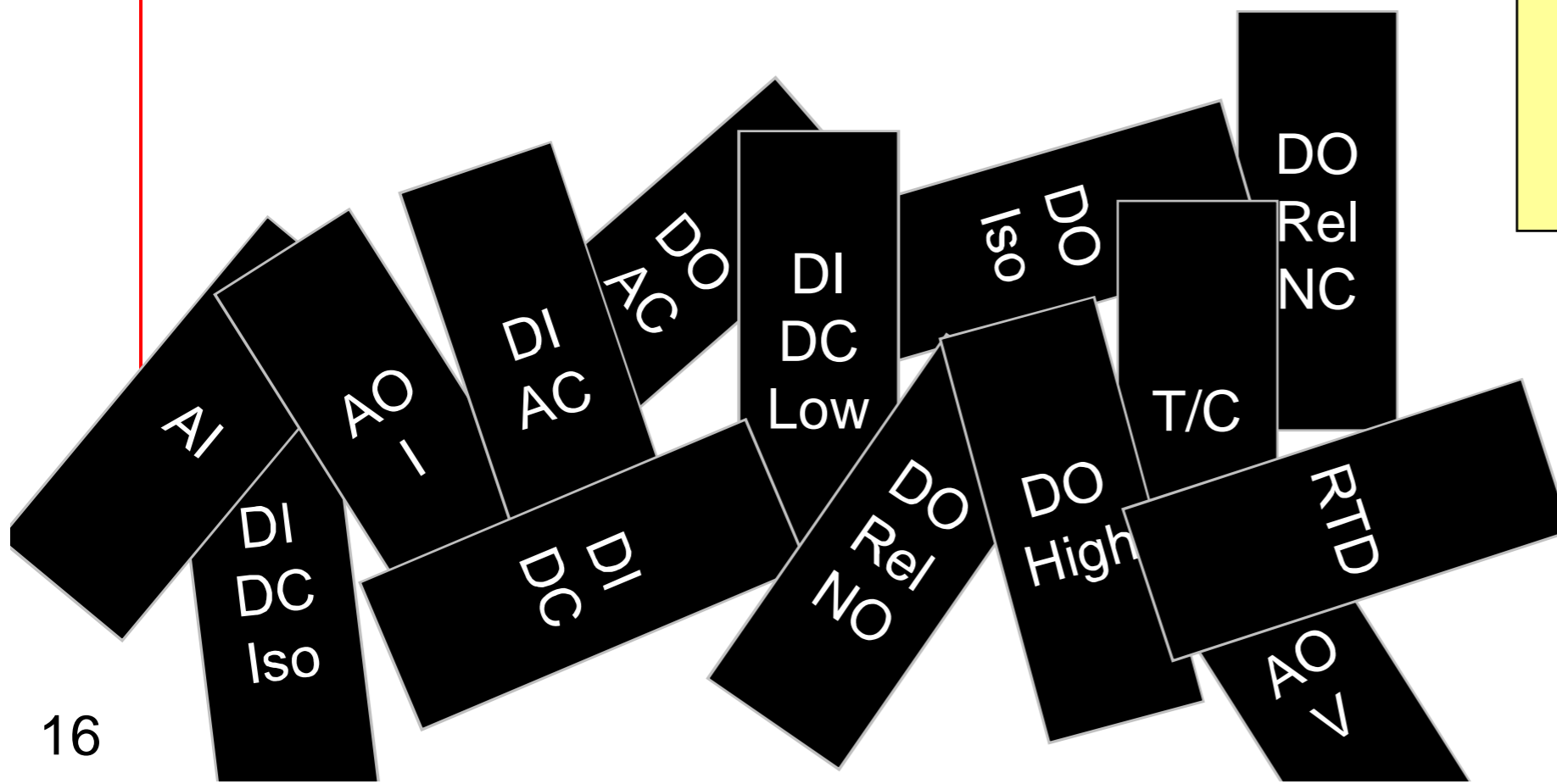


Simpler I/O Design

- Not necessary to know the exact type and quantity of signal for each device

Only devices count

Input, output,
discrete or analog
are all the same



H1



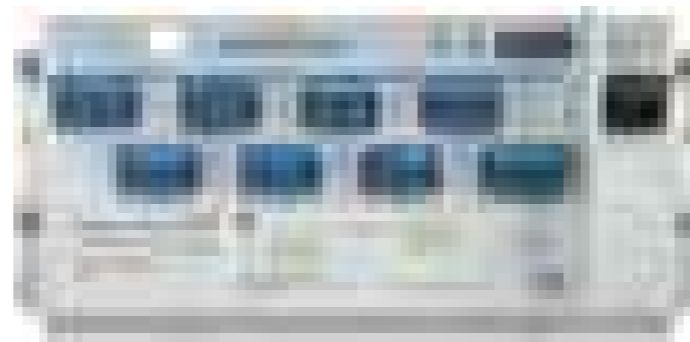
Reduced Device Count

One device takes the place of
many



Multi-Point Devices

- Bus not limited to single real-time value
- Multi-channel temperature transmitters
 - Eight sensors ideal for temperature profiling applications
- Multi-point indicators
- For dual sensor temperature transmitters
 - Both channels can be used for control loops.



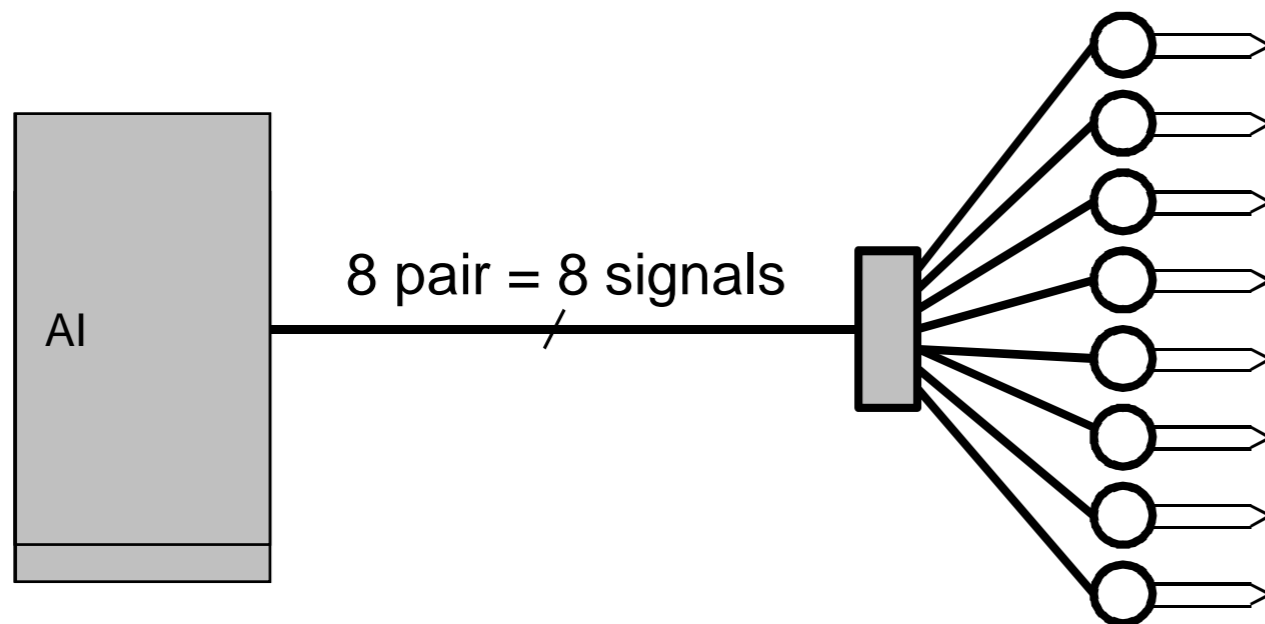
Eliminate 8 transmitters, 8 pairs of wires, and one 8-channel input card



The More Signals per Device, The Greater The Savings

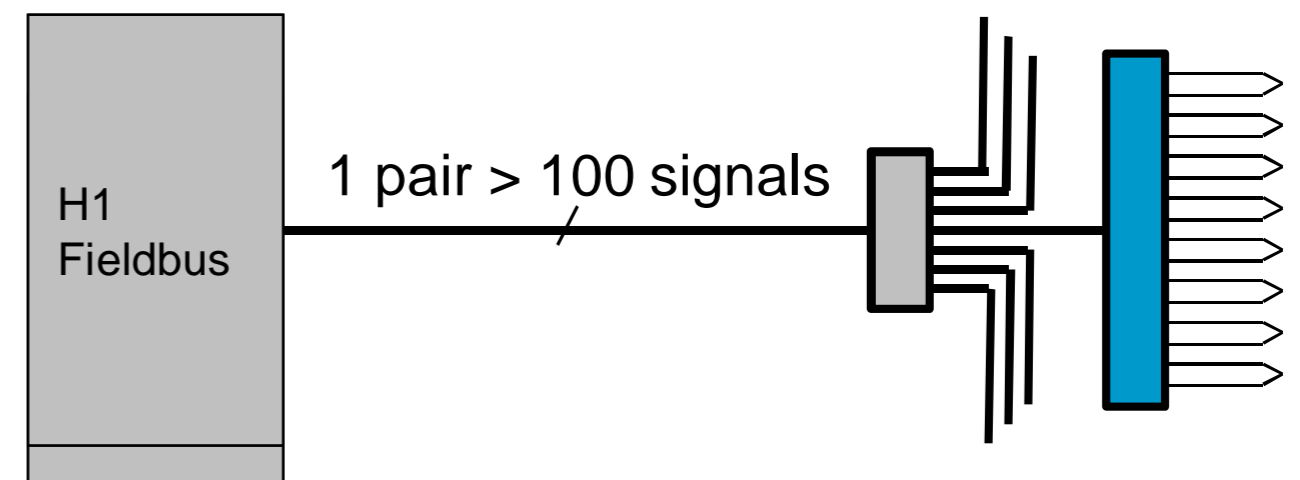
Hardwired

- One signal per pair of wires



Fieldbus

- Many signals per pair of wires





An Open Network Standard

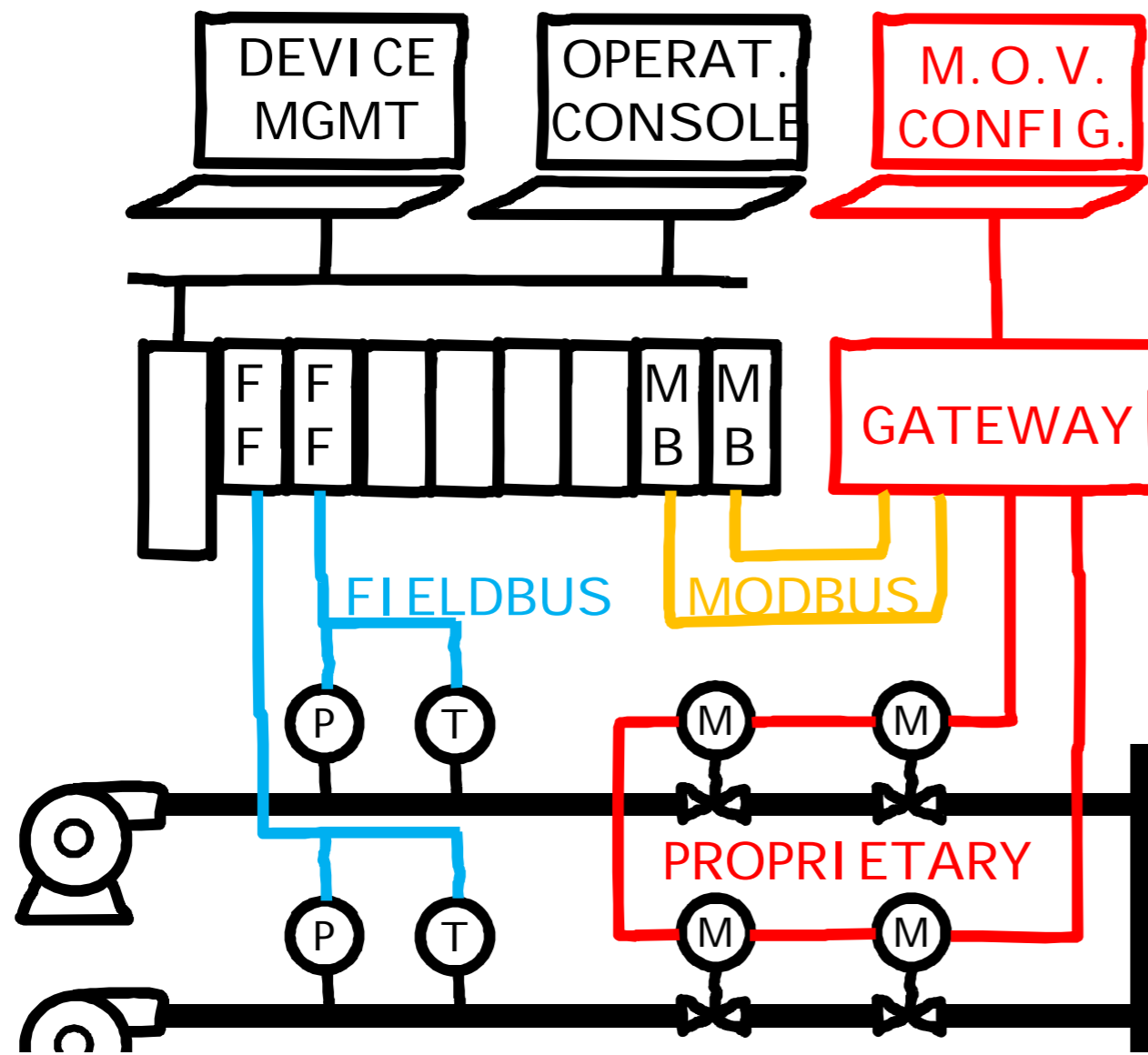
Fieldbus taking the place of proprietary networks



Easy Integration of Complex Device

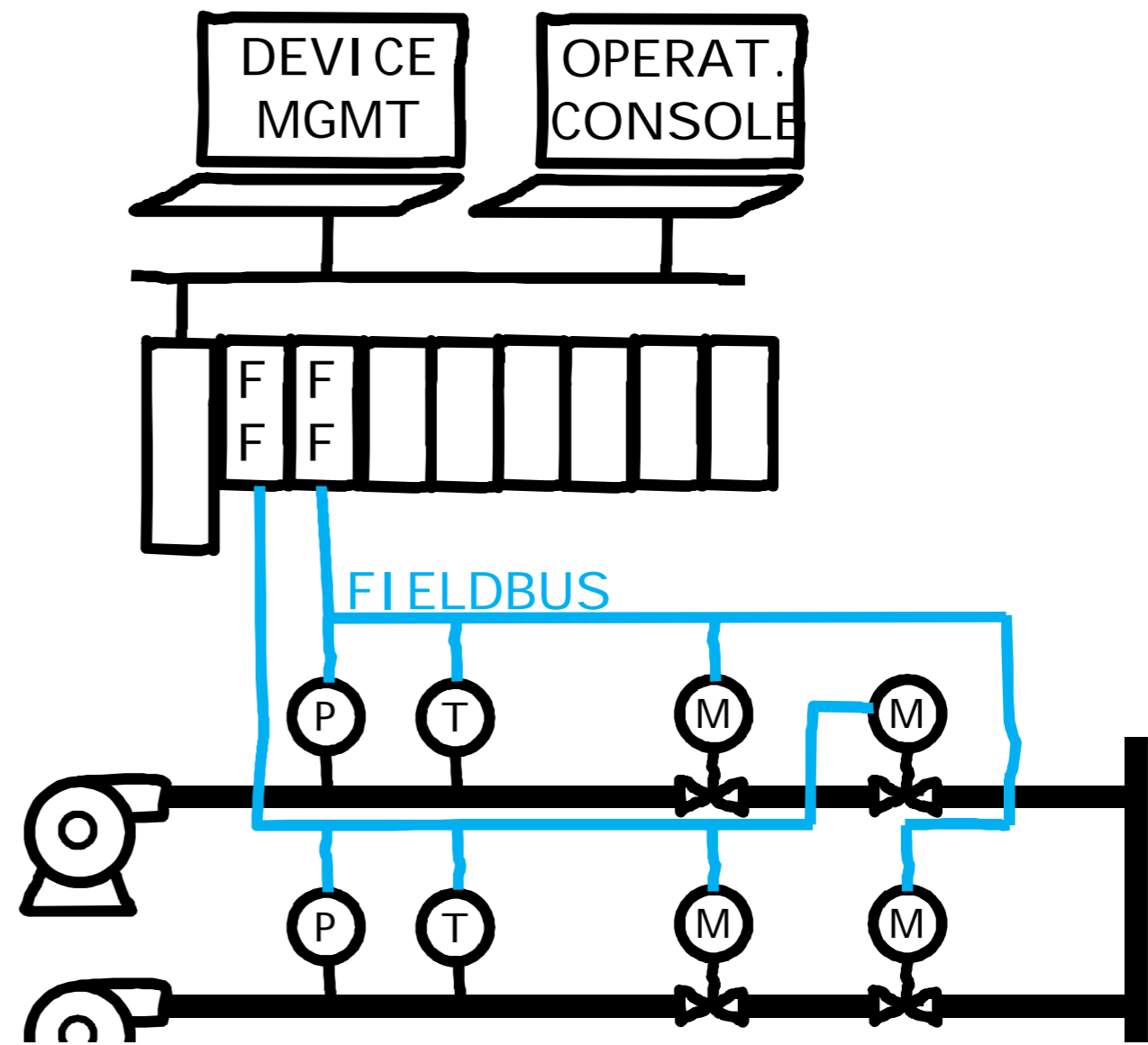
Proprietary MOV

- Dedicated proprietary bus
- Proprietary software



Fieldbus MOV

- Same bus as other devices
- Same IDM software as other devices





Eliminates Single Vendor Dependency

- Freely interchange or replace existing devices with other brands
- Different brand equipment can share the same network
 - Second-source replacement devices
- Choose the best available instruments for their application
- Replace them as needed

Example

Mix and match different brand MOV on the same bus





Faster Commissioning

Test all signals from all devices in
one go



No 5-Point Loop Check

- No 4-20 mA ranging
- No 4-20 mA signal distortion
- Traditional five-point loop tests are replaced by a simple plausibility check



- No range mismatch
- Not limited
- No biased
- No non-linearity
- No current calibration mismatch



Intelligence in All Devices

- Automatically confirms the correct device type has been installed
- For all kinds of devices:
 - Transmitters
 - Positioners
 - On/off valves
 - Electric actuators
 - Etc.





Conclusion



Conclusion


- Reduced hardware requirements
- Smaller system footprint
- Reduced device count
- An open network standard
- Faster commissioning





Where Can I Learn More?

- www.fieldbus.org



Fieldbus
Foundation

FOUNDATION™ Fieldbus

The Power of Digital for your Process Devices

www.fieldbus.org

