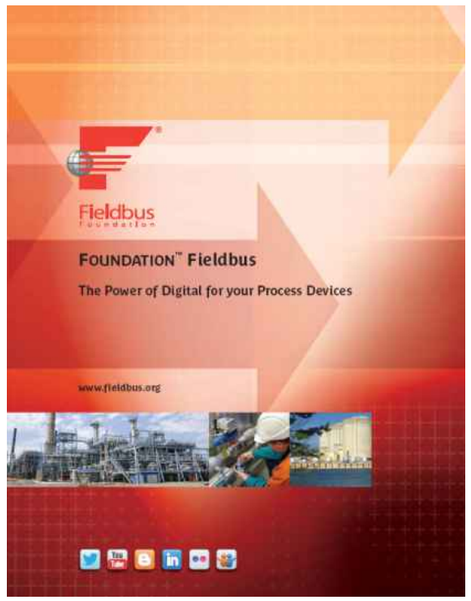
Understanding Fieldbus

All-digital Infrastructure for Plant Automation



Huda Muttaqien
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Topics Covered

- What is FOUNDATION Fieldbus?
- Breaking the Limits of Analog Technology

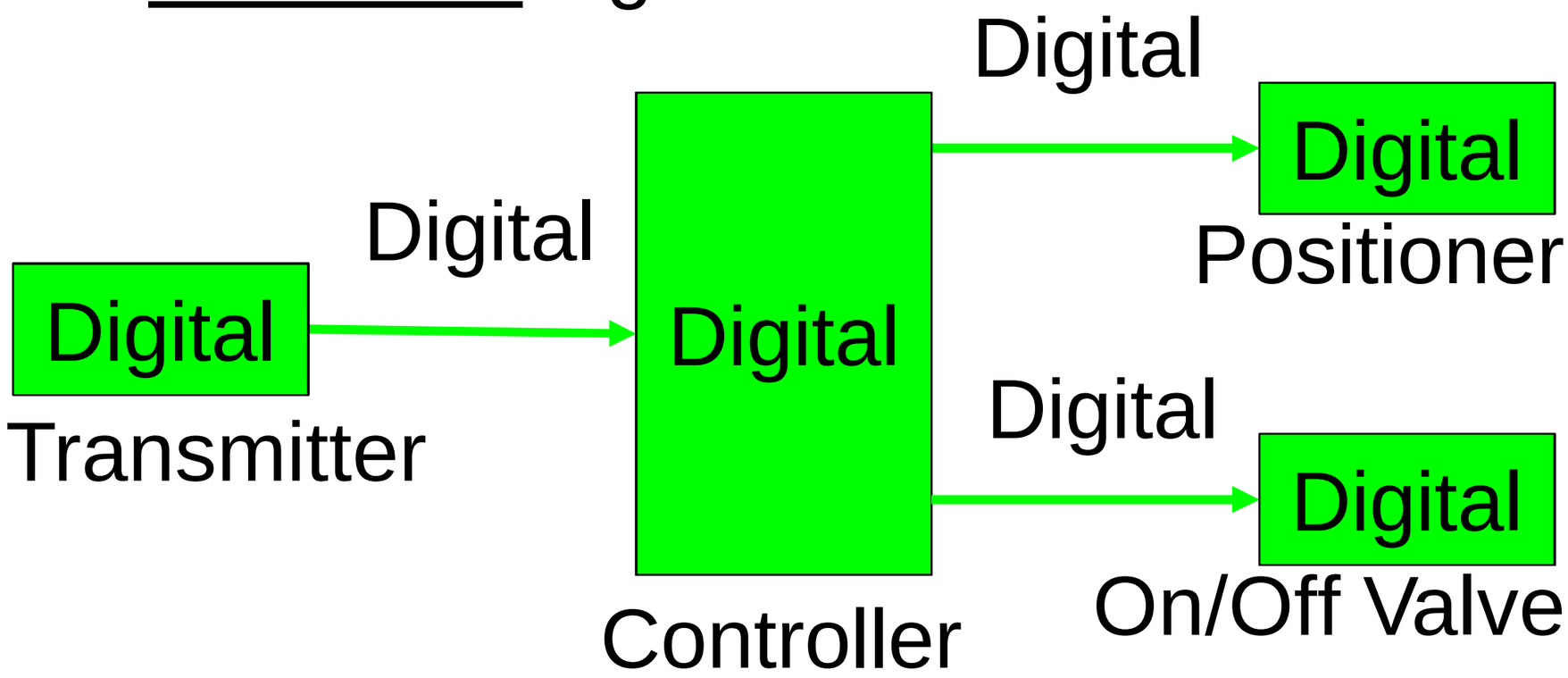
What is FOUNDATION Fieldbus?

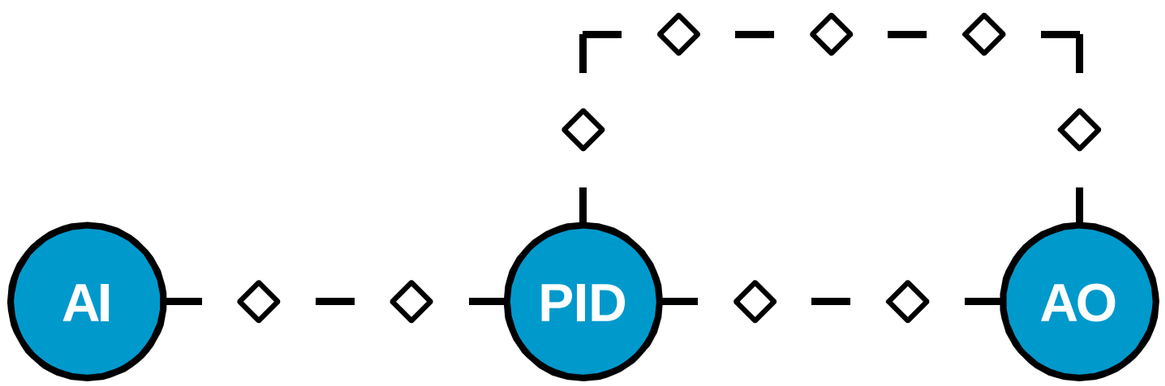
FOUNDATION fieldbus

- A digital communication network
- Real-time
- Designed specifically for process control applications
- Takes the place of 4-20 mA and on/off signals
- Connecting instruments to systems:
  - Transmitters, analyzers, control, valve positioners, and on/off valves
  - Distributed control systems (DCS), programmable logic controllers (PLC), remote terminal units (RTU)

All-Digital Solution From Sensor to Actuator

- Completely eliminating the need for analog 4-20 mA and on/off signals



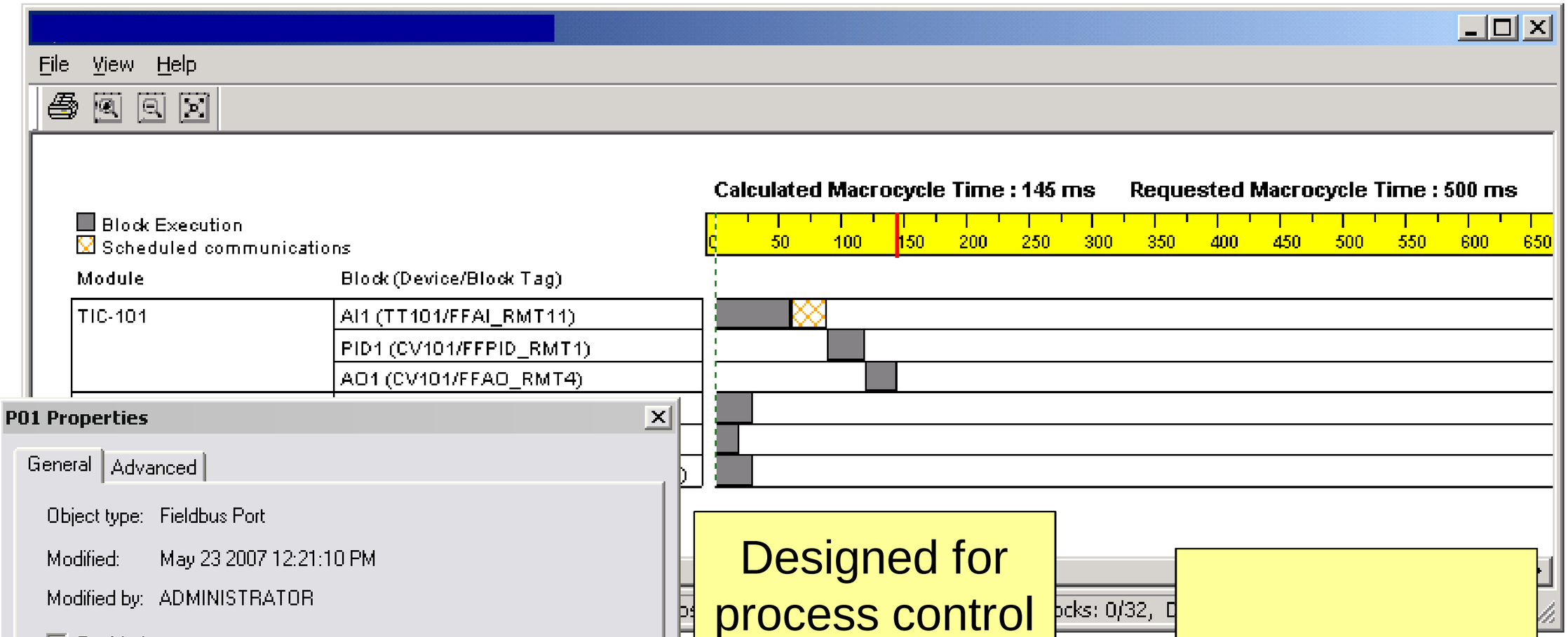


Takes the Place of Proprietary Protocols

- Electric actuators/motor-operated valves (MOV)
- Gas chromatographs
- Tank gauging systems

Real-Time Deterministic Closed Loop Digital Control

- Time-synchronized and scheduled



Designed for process control

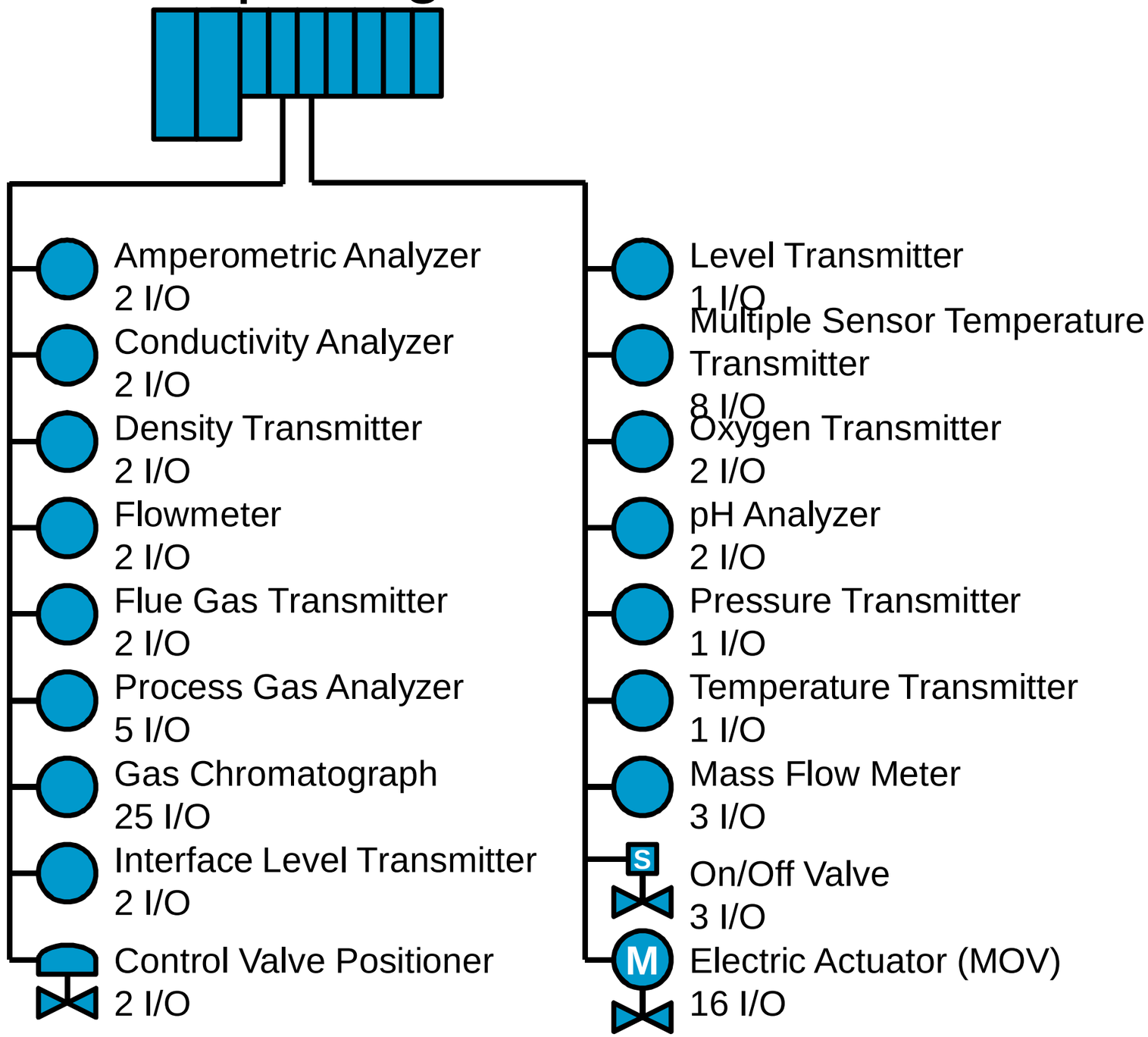
Ideal for PID loops

Schedule is automatically created

Multiple Devices with Multiple I/O Signals, Share the Same Bus

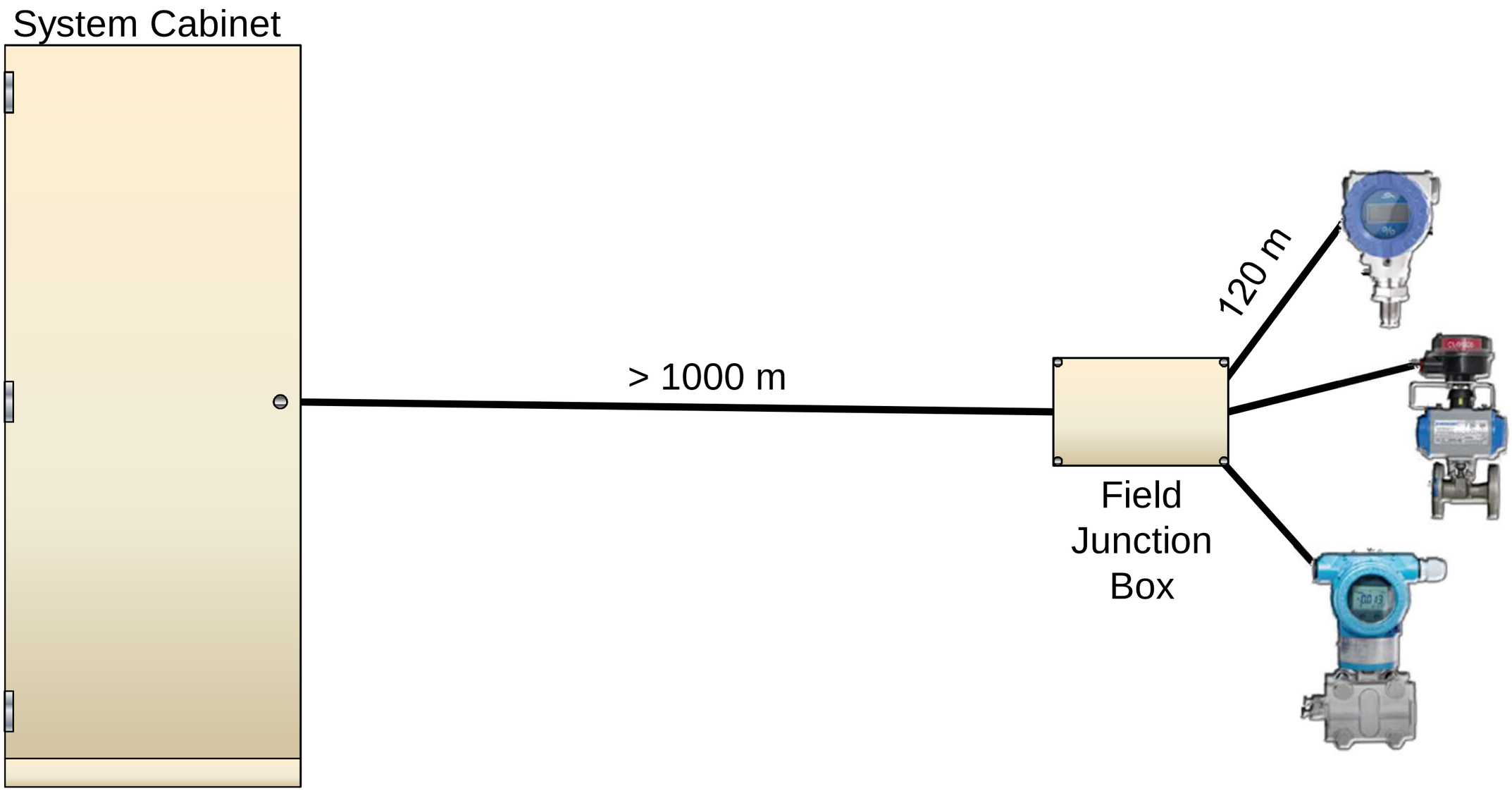
- Devices provide multiple signals over the same two terminals

One fieldbus device takes the place of on average 3 I/O signals



Suitable for Large Plants

- Long cable trunk lengths to field junction boxes
- Long spurs for devices

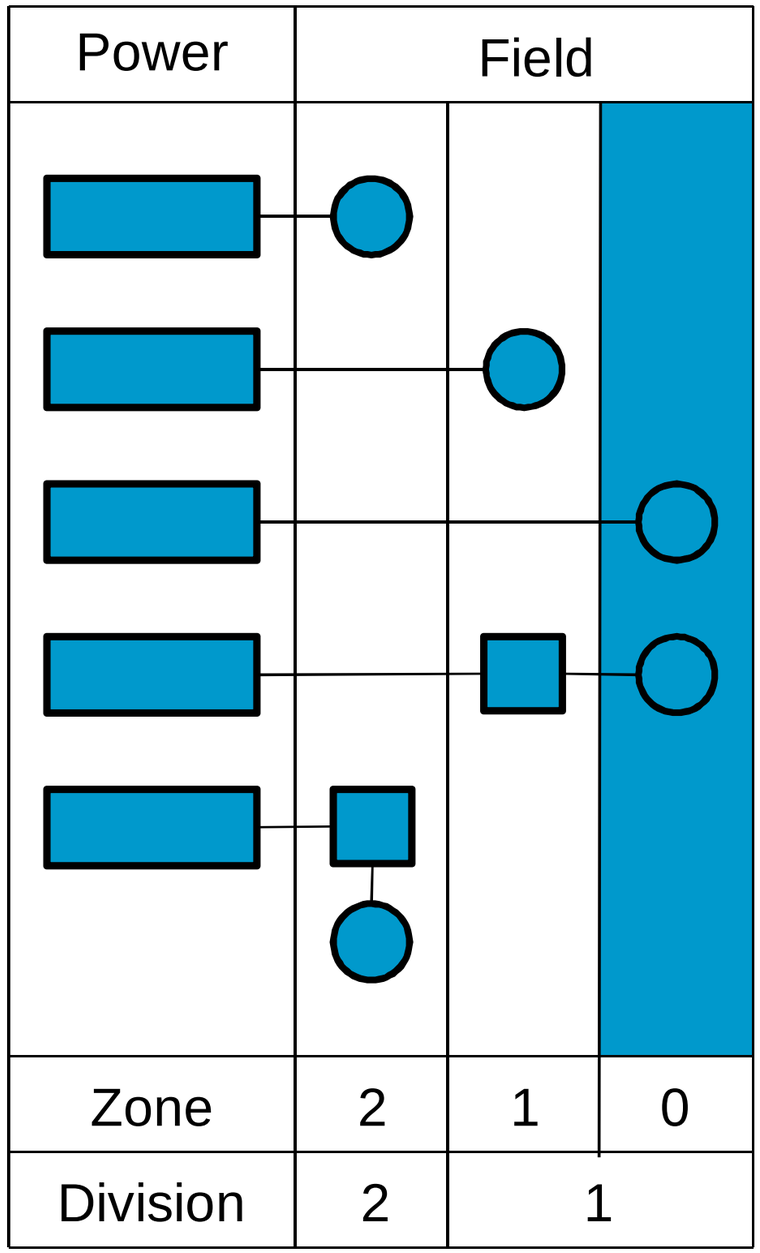


Industrial Grade Wiring Components

- Field junction box hardware is rugged and encapsulated for harsh outdoor field conditions
- Some are passive
- Some are Zone 1 certified

Power and Communication

- Two-wire twisted pair cable
- Device power suitable for all hazardous areas
  - Intrinsically safe
  - Non-incendive
  - Flame proof / explosion proof



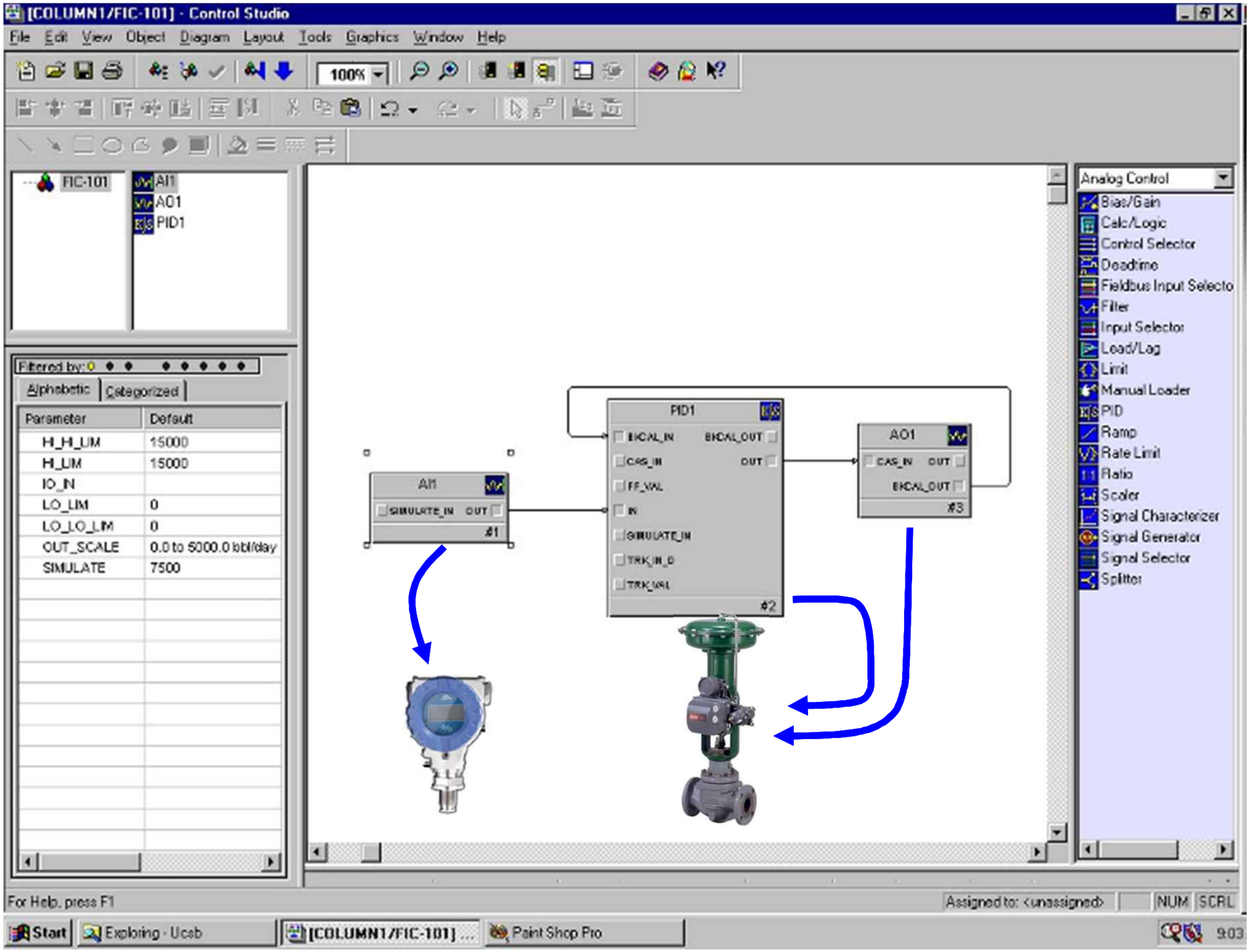
Unrestricted Access to Field Device Intelligence

- Centralized configuration/setup and diagnostics for all field instruments
- Including discrete sensors and actuators

Supports Temporary Masters

- Handheld field communicators
- Laptops/tablets
- Documenting calibrators

Supports Control-in-the-Field (CIF) - Control in Field Devices



Breaking the Limits of Analog Technology

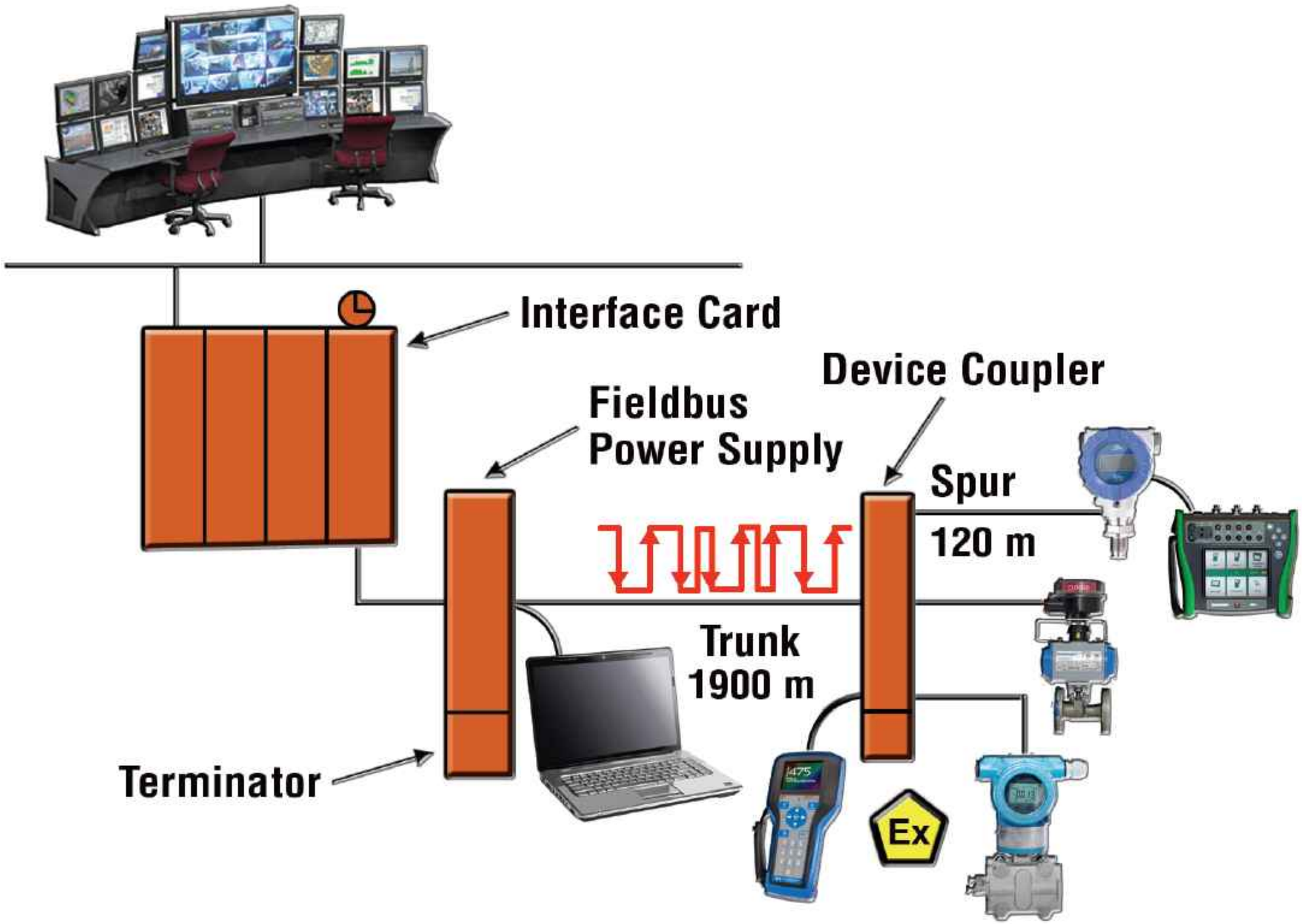
FOUNDATION fieldbus Started with a Few Simple Ideas:

- Reduce cabling
- Simplify marshalling
- Enable real-time digital closed-loop control
- Ensure multi-vendor interoperability
- Expand device intelligence
- Allow diagnostics-based maintenance
- Liberate plants from proprietary protocols

Demonstrated at Plants Around the World

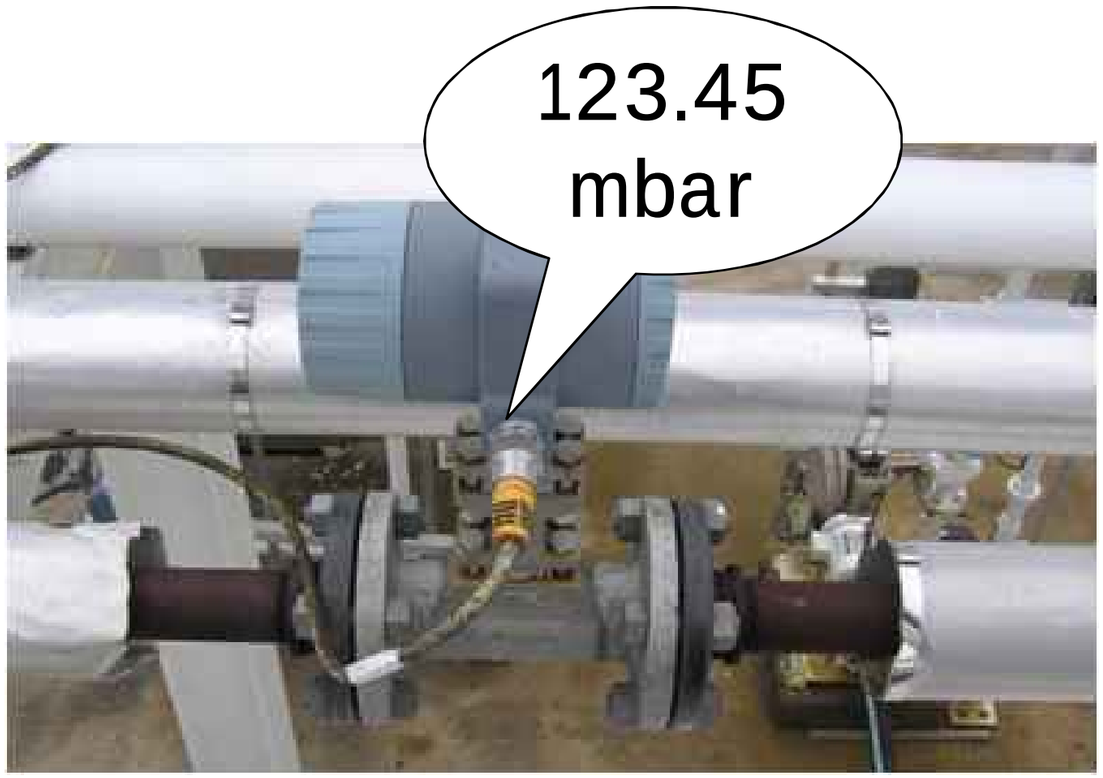
- The benefits of completely digital automation without the limitations of 4-20 mA and on/off signals are enormous.

Fieldbus Components



Engineering Unit Values - No Range Set

- Range setting is reduced, if not eliminated, for most transmitters



No mismatch with range in the control system

Conclusion

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- Reduced cabling
- Simplified marshalling
- Real-time digital closed-loop control
- Multi-vendor interoperability
- Expanded device intelligence
- Diagnostics-based maintenance
- Liberation from proprietary protocols

A comparable result cannot be achieved with 4-20 mA and on/off signals

Where Can I Learn More?

- www.fieldbus.org