Benefits of SPE for sensors in automation

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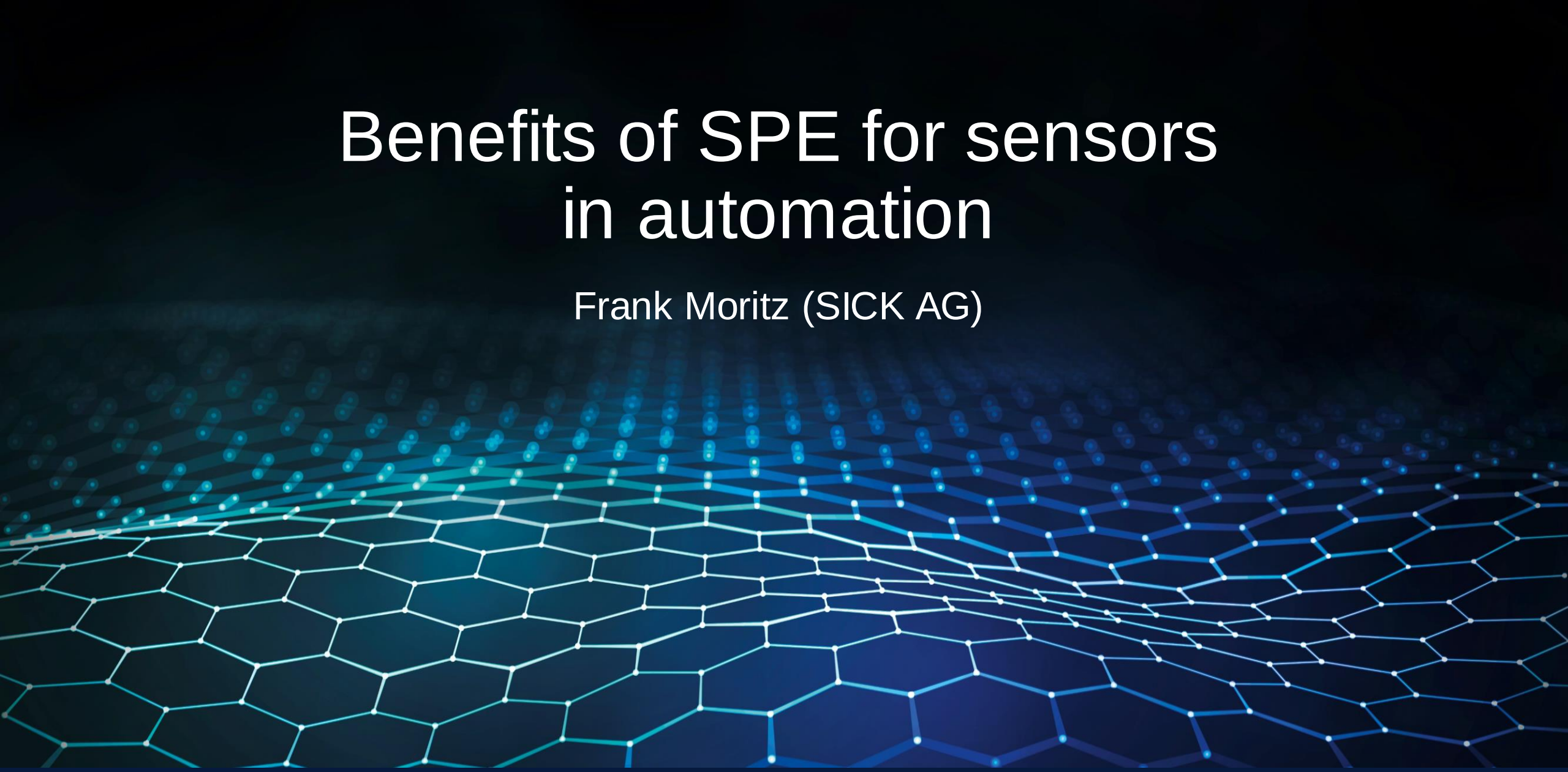

Overview

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- Sensors with SPE in conveyer applications
- Sensors with SPE in compact systems
- SPE in decentralized systems
- SPE in process industry applications

Application storage and conveyer

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Conveyer Sensor Application

- **Functions**
  - Detection of trays
  - Identification of trays
  - Label checking
  - Dimensioning/Weighing
  - Traffic regulations
- A lot of different **Sensors** along the way
  - Switching sensors
  - Identification Readers
  - cameras
  - volume / weighting measurements Units

Needs

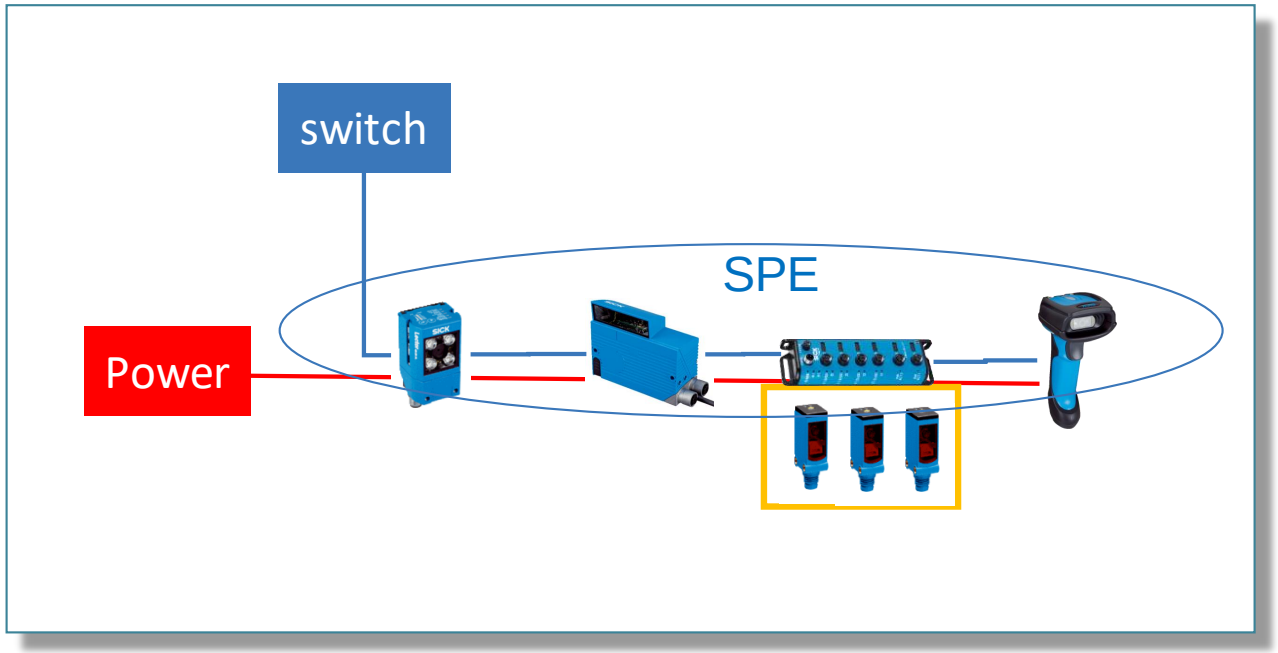
- Connecting the sensors within a line topology structure
- Cost effective power supply for the devices.


ETH


RS232 IO-Link

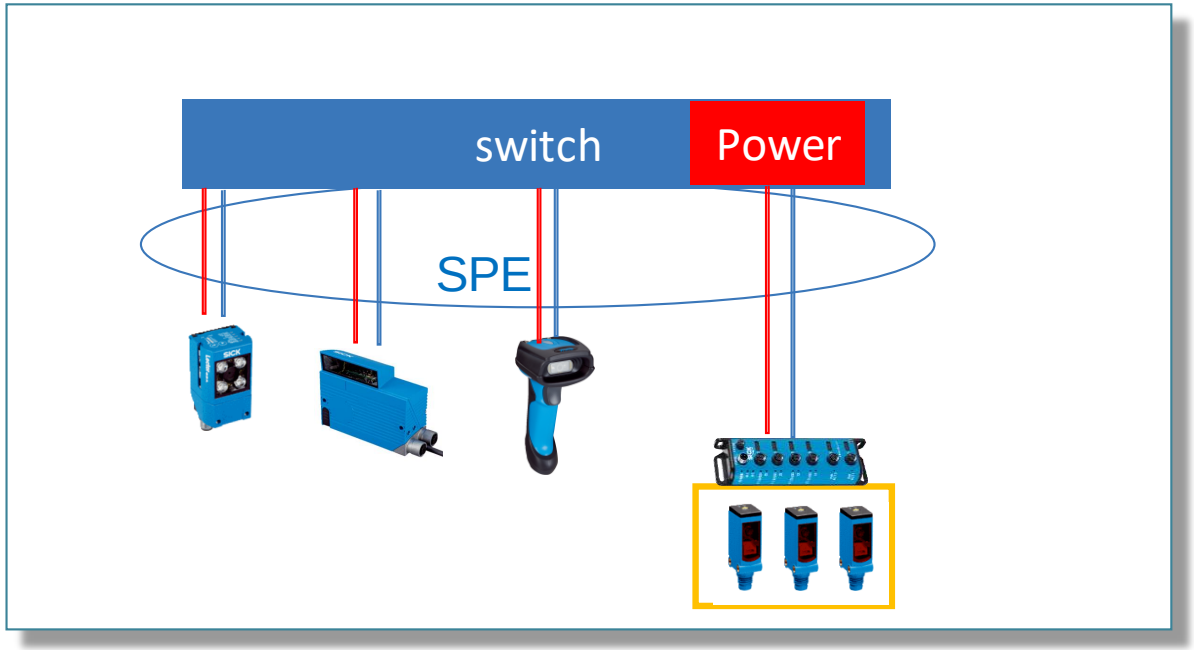
Switching signals

Conveyer Sensor Application



SPE topology for line applications

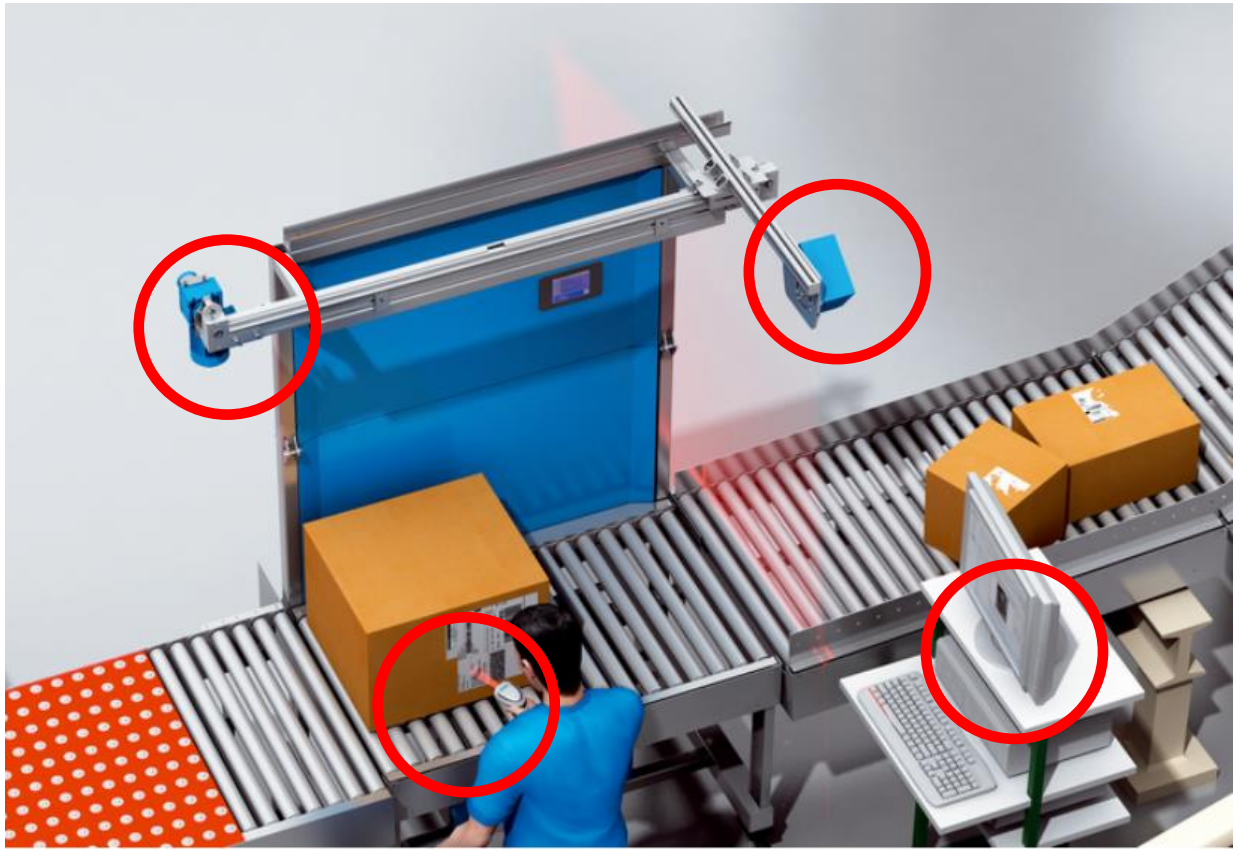
Line power supply is beneficial



SPE topology for compact application

Power over Dataline is beneficial

System Application Dimensioning / Weighing



Compact size system

- Barcode Reader
- Cameras
- User terminals
- Detection Sensors

Functionalities

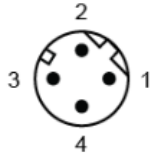
- Sensor to sensor communication
- Sensor to local „system“ communication
- Sensor to remote diagnostic / maintenance System

System connectivity and components today

+

RS232
+ Power M12 A-Coded
+ Profinet 2* M12 D Coded

M12, D-coded



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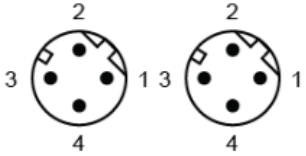
Power & IOs

M12, 17-pin

2 M12,
D-coded



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Power

M12, 5-pin , A-coded

- Compact System Distance < 15 m
- Different connectors and Ethernet protocols
- Need of gateways for classical RS 232 Interfaces
- Different connectors for Power

Using SPE will unify variants in connectors and interfaces

Benefit with SPE

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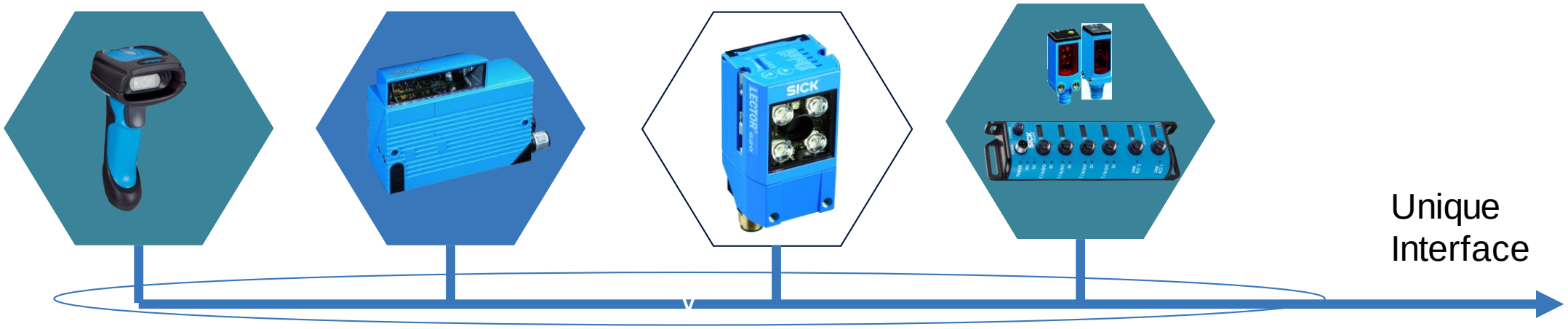
- Consolidation of Interfaces / Connectors
- Less Gateways required
  (seamless interfacing)
- Lower implementation space (on device) required
- Daisy chain or Multidrop topology
  enable efficient wiring
- No extra **power** connector (with PoDL support)
- Enables Ethernet services on constrained devices



Application Decentralized Systems

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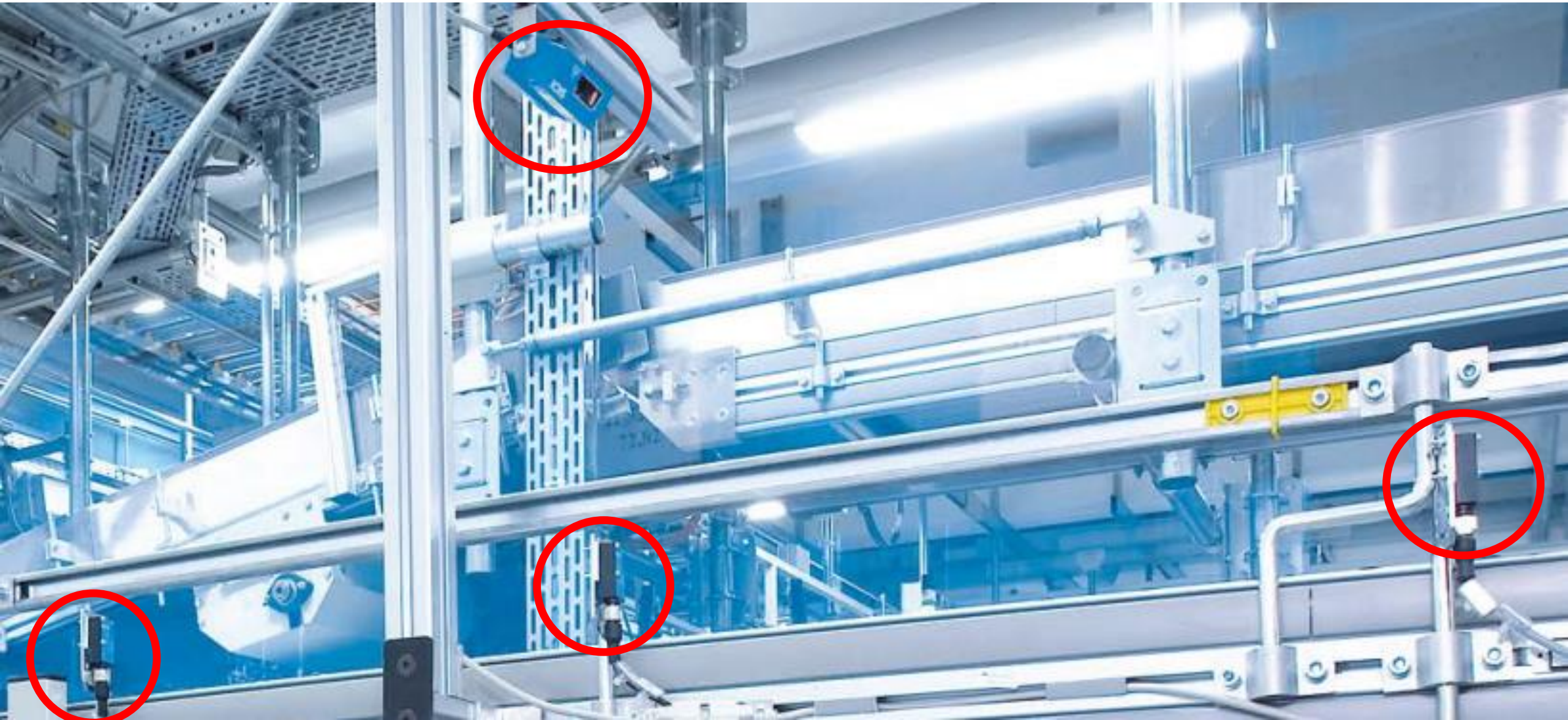

System Application Quality Control

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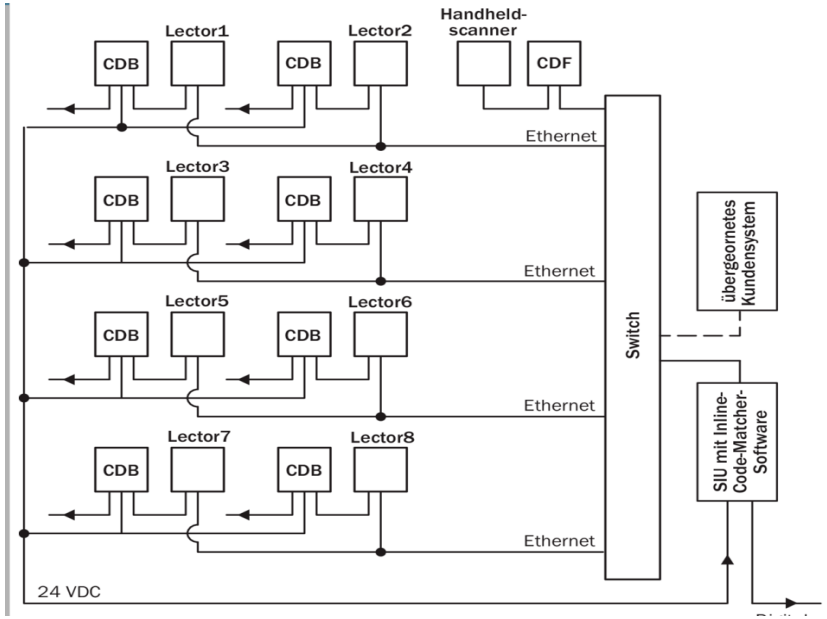
Functions

- Label reading

(check for the right product in the right box)

Compact System
Distance < 15 m



Sensors

- provide data to an evaluation / display unit
- Different connectors for power and communication

Needs

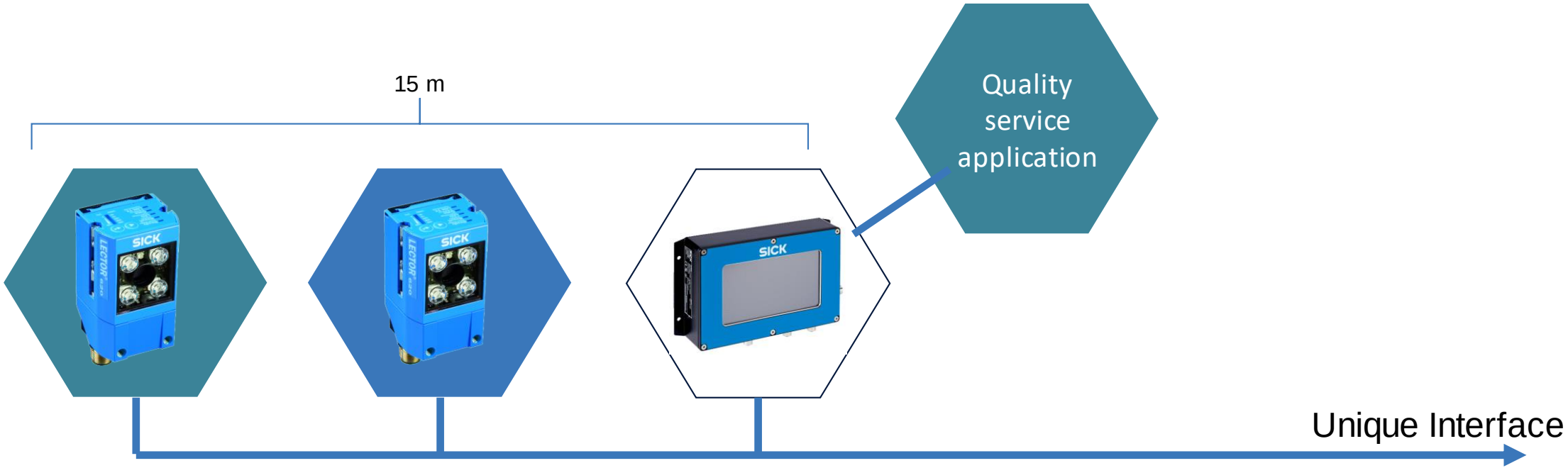
- Connecting sensors to an evaluation unit in a unique and cost effective way.

Benefit with SPE

- One interface for all components
- MultiDrop or Daisy Chain will reduce cabeling cost and wiring effort.

Solution:

- 100 Mbit / 15m Multidrop



Application Process Automation

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Process Automation Measurement

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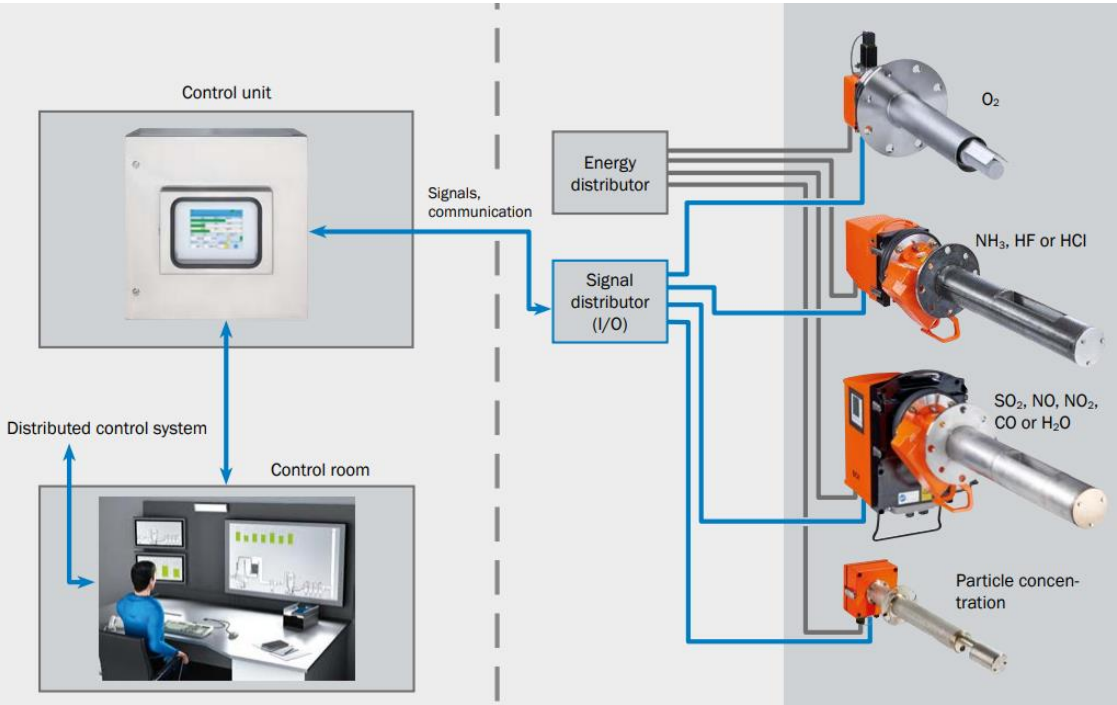


Functions

- Measurement
  - Gas / Dust / Particles

Sensors

- Different for gas, dust, particles

Need

- Connecting sensor for intrinsically safe environment
- Increase of communication speed
  (replacement of HART Interface)

APL = Advanced Physical Layer intrinsically safe SPE

Process Automation Application

- Gas or Dust Analyzer systems

Functions

- Measurement of Gas, dust or particles

  Compact System Distance < 15 m

Devices

- Sensors & Evaluation units (cabinet)

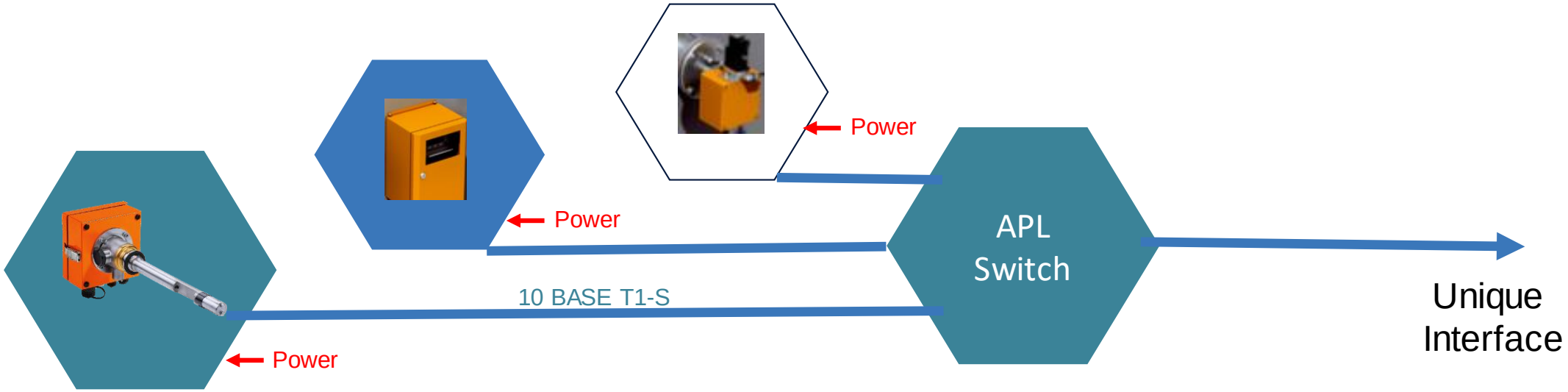
Needs

- Connecting Sensors to an Analyzer unit (cabinet)

APL = Advanced Physical Layer intrinsically safe SPE

Benefit with SPE / APL

- Efficient connecting sensors (with power supply)
- Fast 10 Mbit APL vs. HART communication
- Easy wiring down to Zone 0 (with power supply) up to 200m
- Long Reach (1000 m) for Zone 1,2



Ext. Power may be needed

APL = Advanced Physical Layer intrinsically safe SPE

Benefits of SPE vs Ethernet Standard

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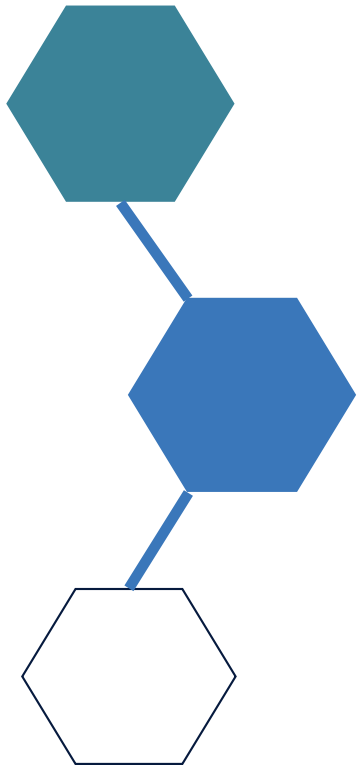

- **Extension** up to 1000m possible (for long reach applications)
- Lower **weight** and **dimension** of cables (for space constrained applications)
- Additional **power** supply available (for point to point connections)
- Reduced **space** requirements for device implementations
- Elimination of power connectors (PoDL on devices)

Additional benefits of SPE

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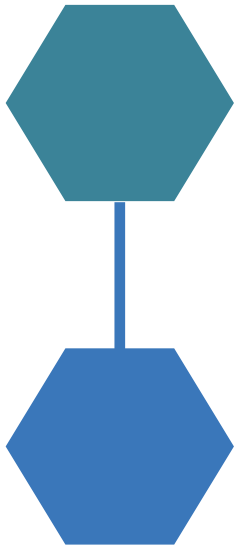

Enables seamless **digitalization** even for cost and space constrained sensors.

SPE will provide **cost** and space **optimization** for all infrastructure components