### **Practical Practise**

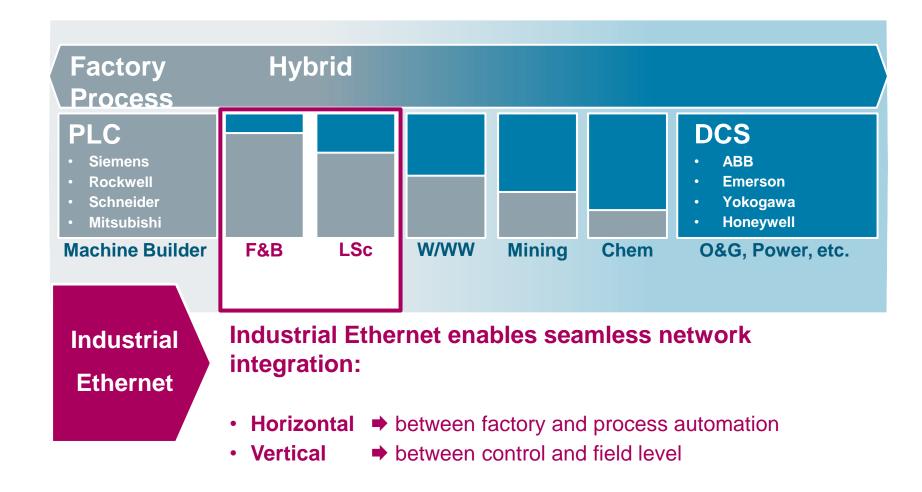


How to exploit the added value of Industrial Ethernet?





### **Automation Trends in the Hybrid Industries**





#### There are several Industrial Ethernet flavours



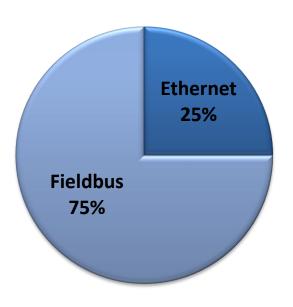
You have to select one which serves your application best!

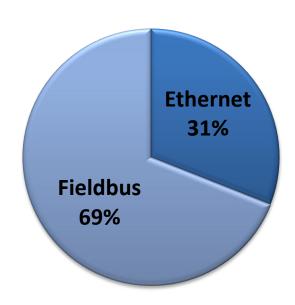


#### **But what about Fieldbus?**

World Market Share for Industrial Ethernet and Fieldbus Technologies

2011 2016



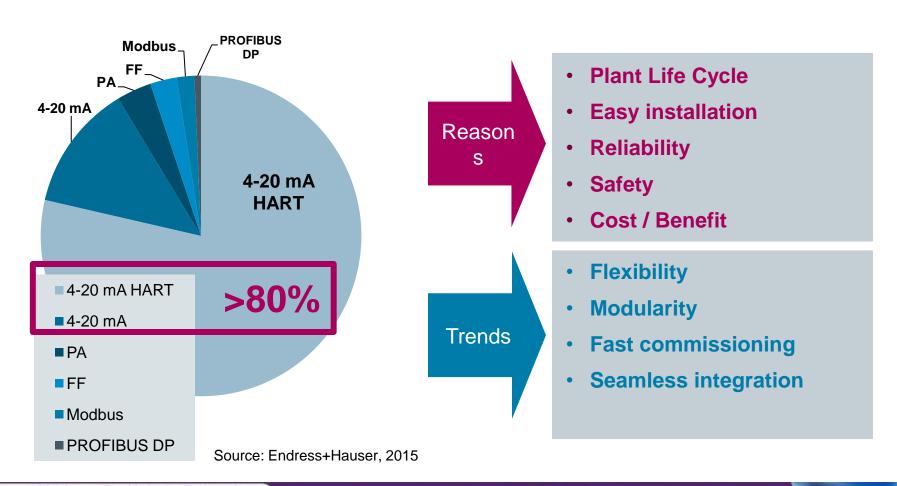


Source: IMS Research 2011 (www.ihs.com)



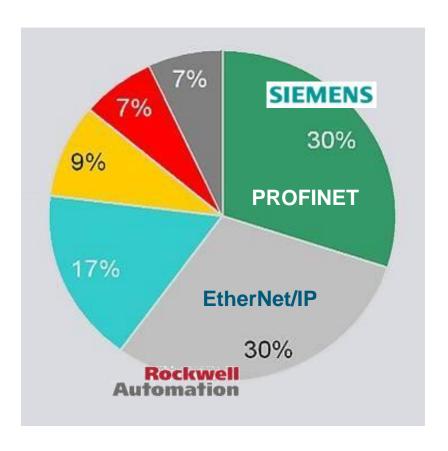
### Usage of Fieldbus communication protocols

More then 80% of measuring points are equipped with 4-20mA and HART!





#### **World Market for Industrial Ethernet**



There are two main Industrial Ethernet protocols in the market that have significant market shares and growth rates: **EtherNet/IP** and **PROFINET** 

EtherNet/IP is offered since 2010 by Endress+Hauser and experiencing strong demand from the food industry in North America.

Endress+Hauser releases first flow meter with PROFINET in 2016.

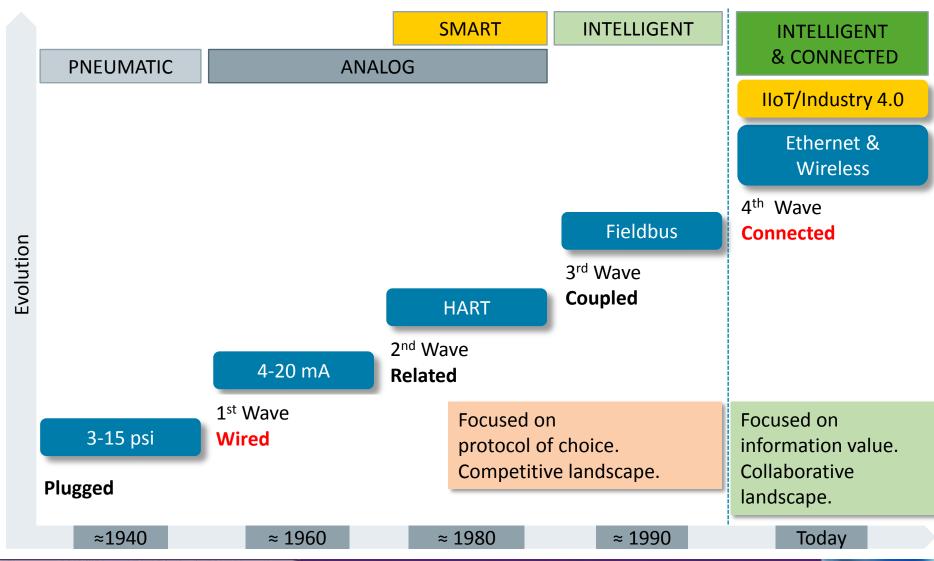


Source: IMS Research "The World Market for Industrial

Ethernet – 2013 Edition"



#### **Evolution of Smart Instrumentation**

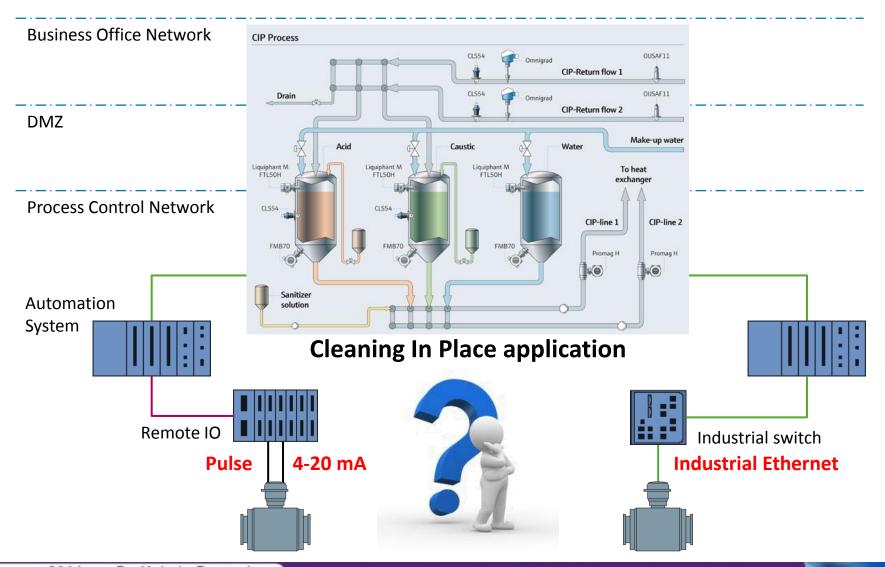


17 maart 2016 ••• De Kuip in Rotterdam

# Industrial Ethernet



#### 'Wired' vs. 'Connected'





### Challenges for machine manufacturers

Competition and customer expectations continue to increase.

Operational efficiency combined with flexible project execution is a "must"

Project duration decreased down to 1 year, in some cases down to 10 weeks

Time for quotation down to 2-3 weeks



Scalable plant concepts

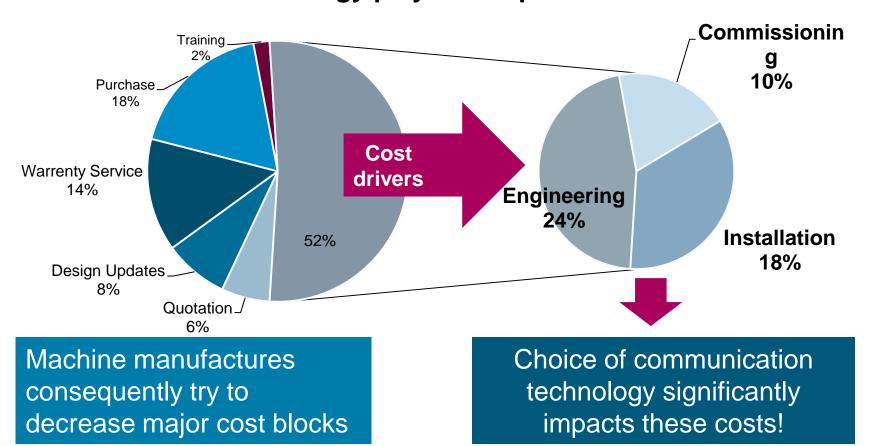
Standardization





## Challenges for machine manufacturers

Machine manufacturers must reduce costs to stay competitive! Communication technology plays an important role!





### Challenges for machine manufacturers

#### Food safety and quality is non-negotiable!



Safe production at any time in the production and packaging process

Continuous product quality



Minimize down time(cleaning, calibration, maintenance etc.)

Monitoring of critical product parameters, e.g. density, conductivity



Industrial Ethernet provides all this



#### The value of 'Connected' Industrial Ethernet



Maximized engineering efficiency

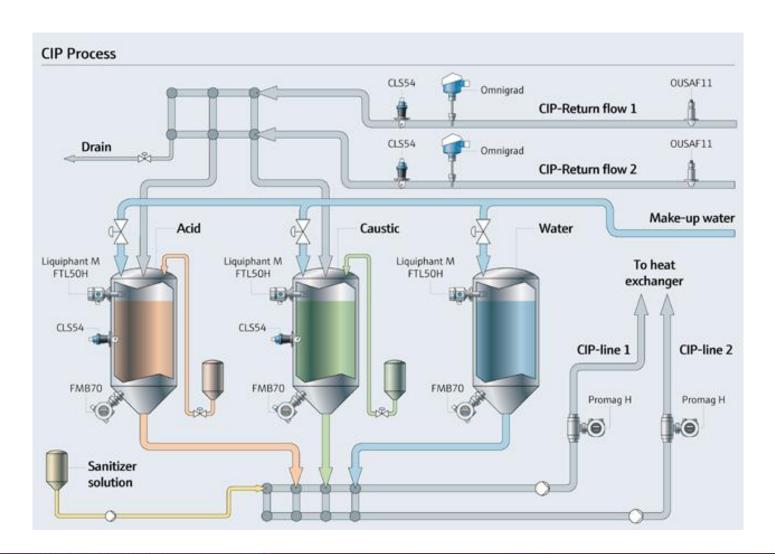
Minimized commissioning time

Increased operational performance

Improved maintenance processes

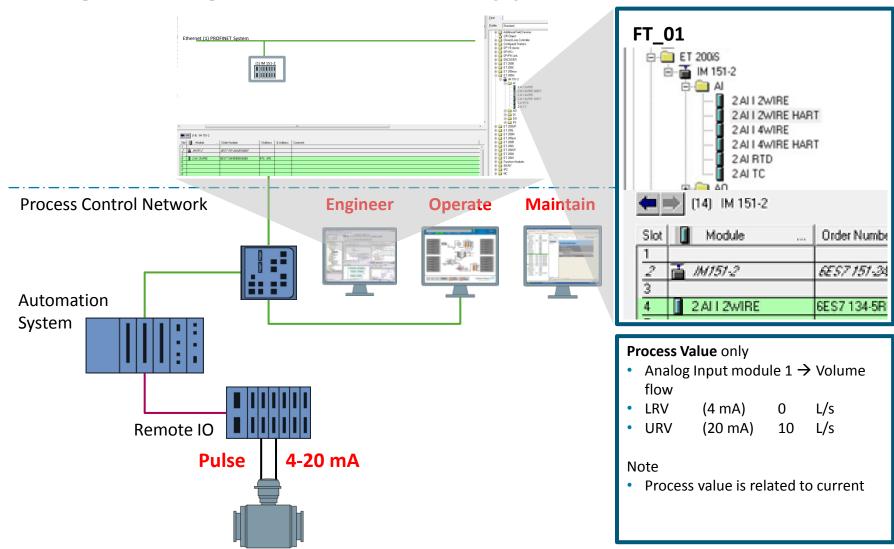


### **Cleaning in Place application**



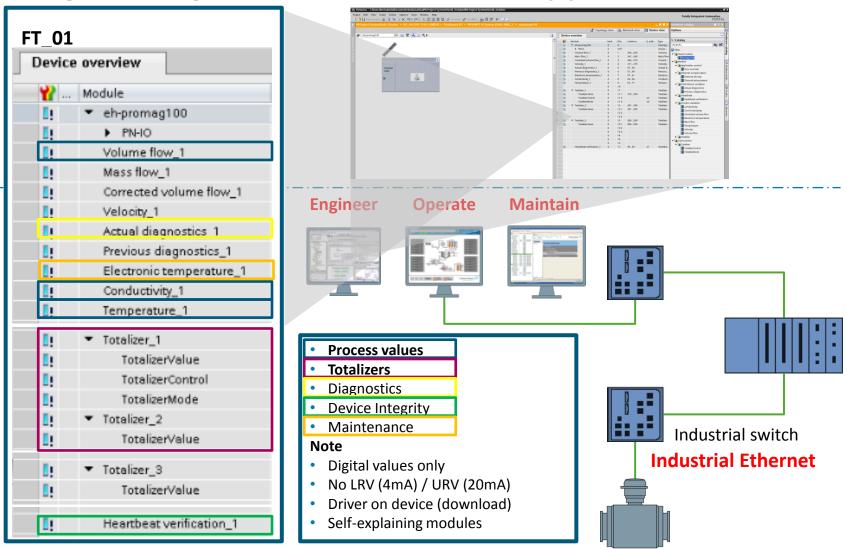


## **Engineering Station 'Wired' approach**





### **Engineering Station 'Connected' approach**





### From engineering to commissioning

#### Design once and copy for many machines!

- Off-line configuration of flowmeter with 'Start-up' record
- Automatic download of configuration via controller
- Standardized modules reduce engineering and commissioning costs



#### Copy many times

- → repeatable machine quality
- → cuts engineering costs
- → cuts commissioning time

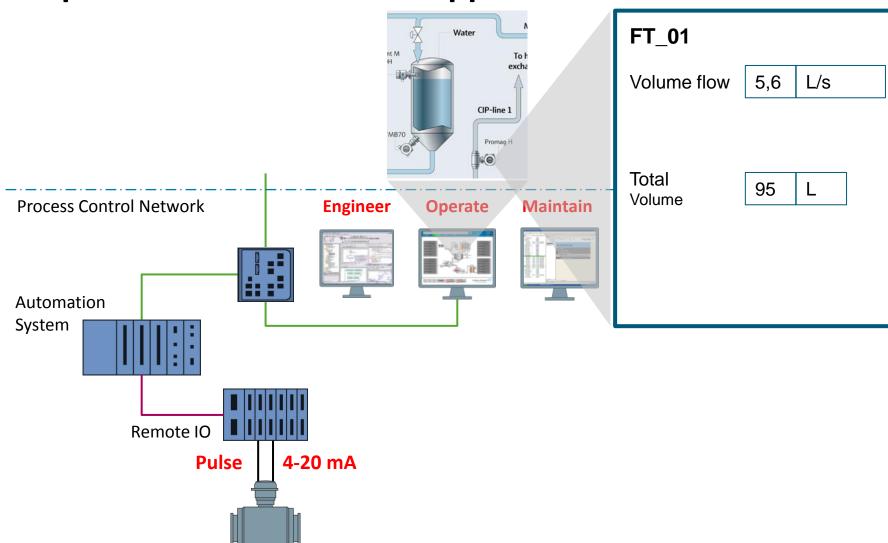






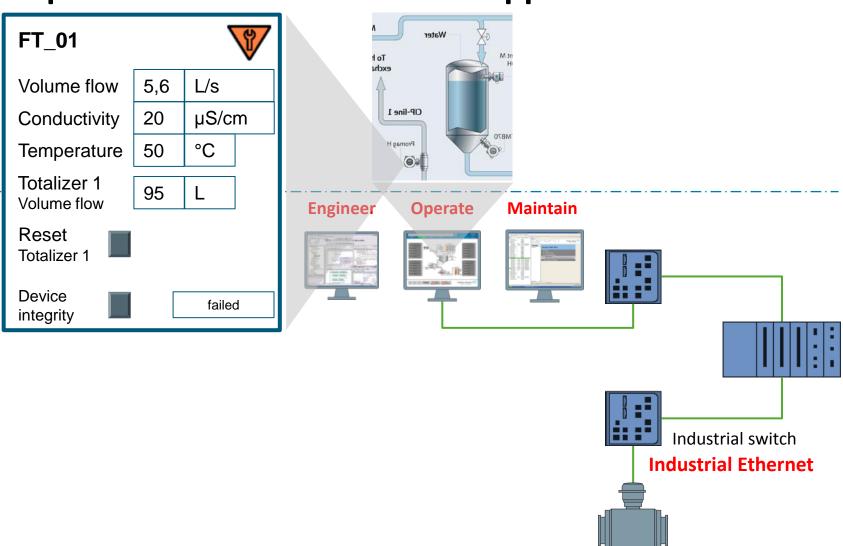


### **Operator Station 'Wired' approach**





### **Operator Station 'Connected' approach**





## Full access on all process values

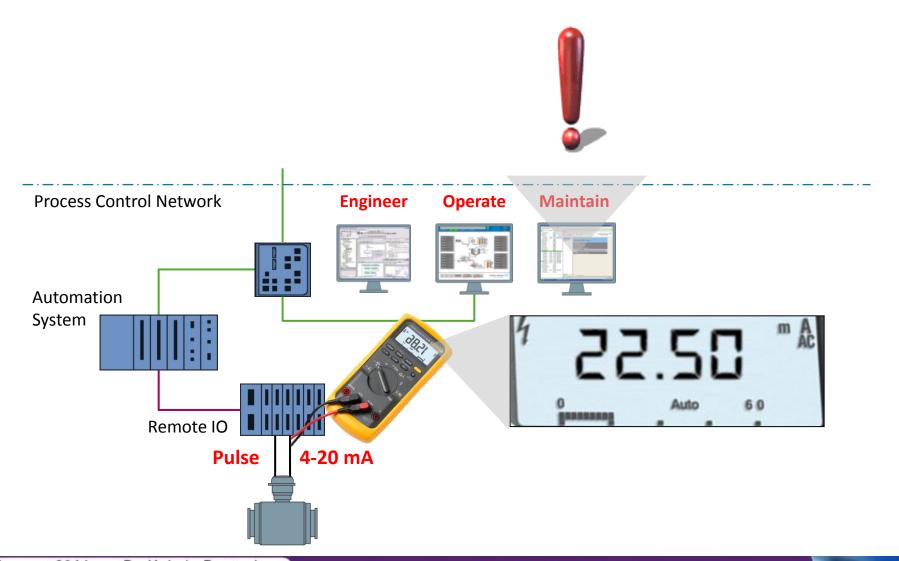
#### **Process insight with the speed of Ethernet**

- Comprehensive access on all relevant process data in one cycle
- Short response times down to 10ms
- Cyclic data access speed down to fractions of seconds – faster than other standard protocols, critical process parameters are continuously captured



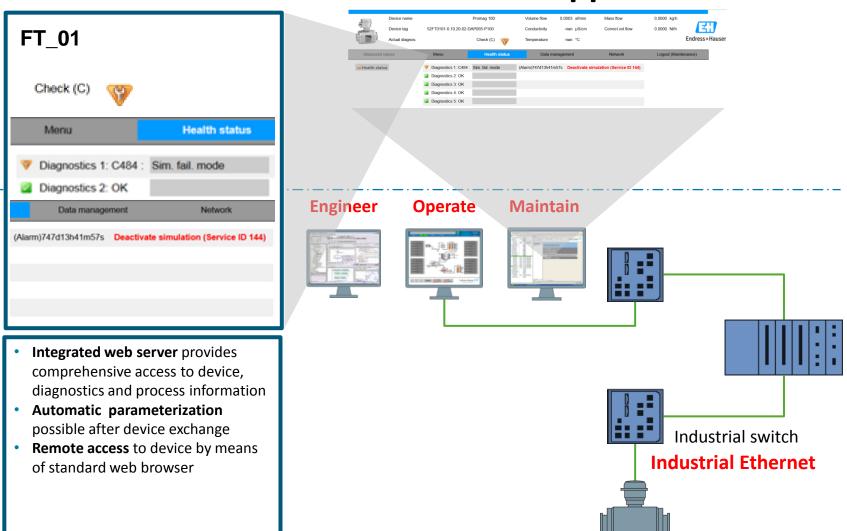


### Maintenance Station 'Wired' approach





### Maintenance Station 'Connected' approach





#### **Conclusions**

- Internet technologies move into the field. Automation is going to become an application of the 'Industrial Internet of Things'.
- Internet, or more general, Information Technologies will be directly integrated in devices on the shop floor respectively on the field level of process plants.
- Industrial Ethernet will be a core network in these new architectures and substitute the classical fieldbuses in the long run.
- There are preconditions to be fulfilled. Standards have to be developed and IT/Cyber security becomes an important subject to all products with Ethernet connectivity - also to field devices for process automation.
- Important steps towards the new paradigm of industrial production are already done. But there are still gaps to be closed.



#### **Information**

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