



ethernet-apl™
advanced physical layer



Ethernet APL

Advanced Physical Layer

A look back – the origins of Ethernet APL

Ethernet APL Group



Core objectives:



Protocol independent



Simple and robust connections



Modern technology and simple commissioning



Higher data speed



What is Ethernet?

What is Ethernet APL?

What is Ethernet APL?

Overview



- Advanced Physical Layer (Ethernet in the sensor)
- 2-wire technology (supply + communication)
- Data bandwidth up to 10 Mbit/s
 - ~10,000 times faster than HART!
- Up to 1000 m cable length







What is Ethernet APL?

Overview



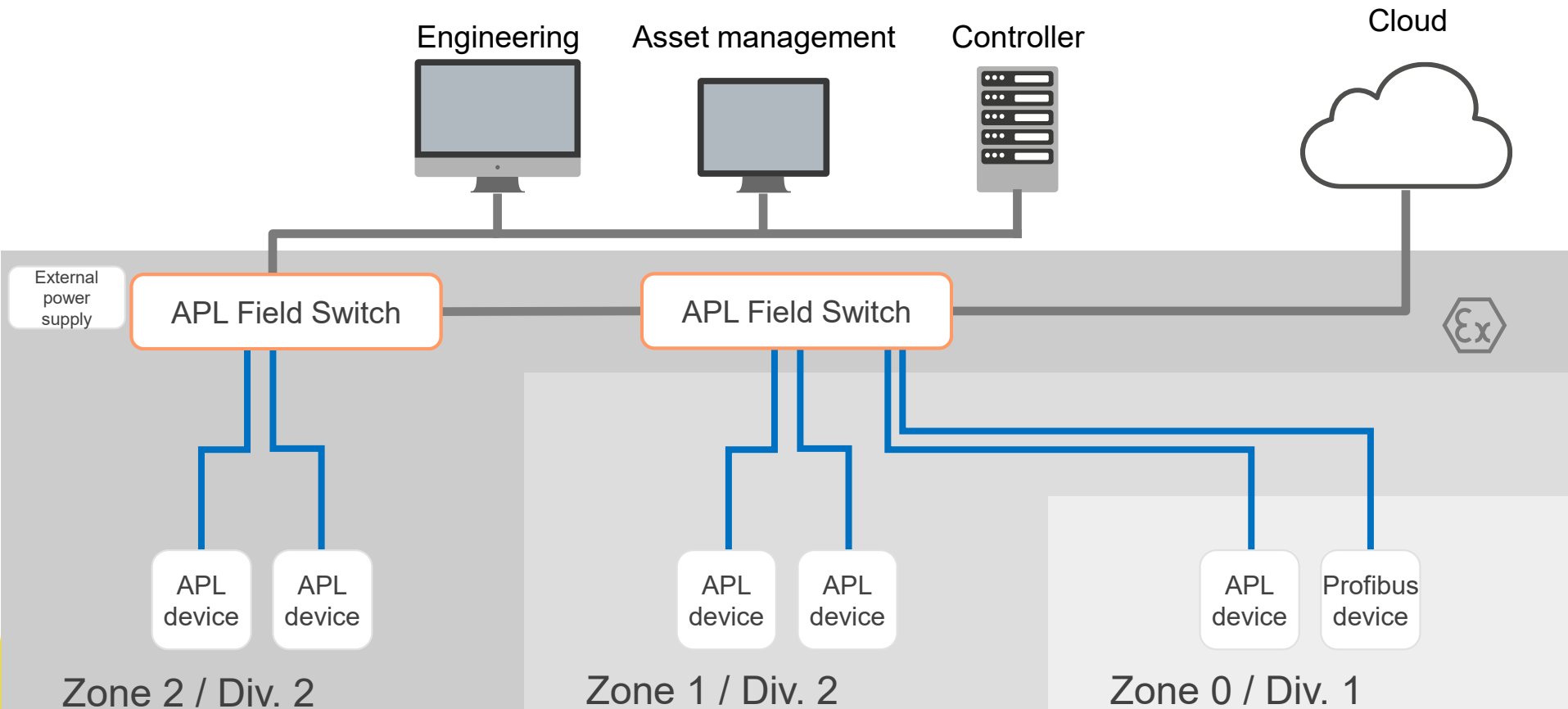
Intrinsically safe supply Ex ia

- Protocols:    
 - PROFINET, Modbus TCP/IP, OPC-UA, Web-Server
 - Ethernet/IP, Modbus TCP/IP, OPC-UA, Web-Server
- Option to implement security in accordance with IEC 62443-4-2

How is an Ethernet APL network structured?

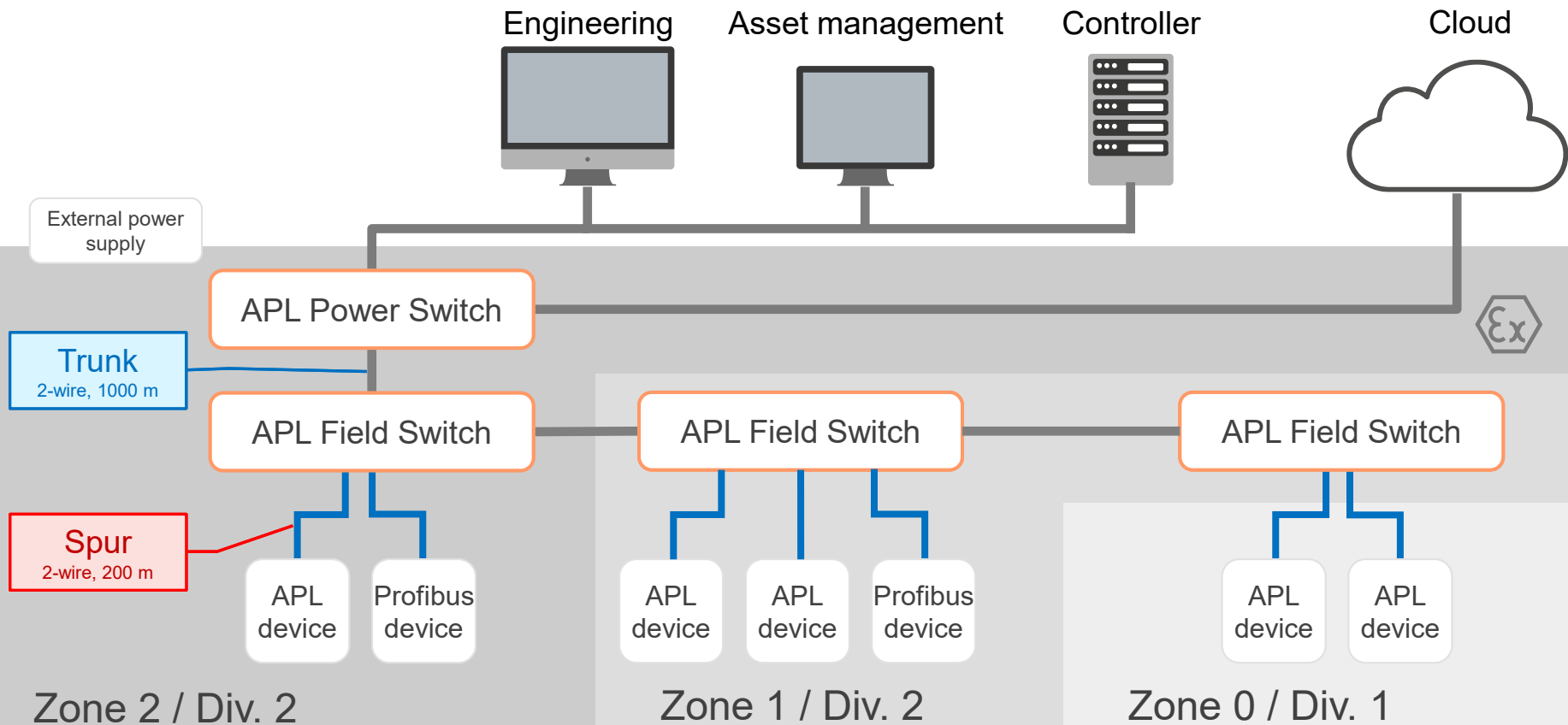
Ethernet APL

Ex concept: Compact systems



Ethernet APL

Ex concept: Extensive systems



Comparison with today's technologies









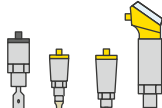


4 ... 20 mA/HART

Profibus PA &
Foundation Fieldbus

IO-Link

PROFINET &
EtherNet/IP

OPC/UA

Level	Field	Field	Machine	PLC, Field	PLC, Field
Benefits	Automation	Automation	Automation	Automation	IIoT, Visualisation
Cable	Two-wire	Two-wire	Three-wire	Two-wire	Two-wire
Connection, Ex i	Terminals 	Terminals, SUB-D 	M12	Terminals 	Terminals 
Range	1000 m	1000 m	20 m	1000 m	1000 m
Topology	Point-to-point	Line, tree, star, ring	Point-to-point	Point-to-point	Point-to-point
Speed	Very slow	Slow	Fast	Very fast	Very fast
VEGA products	Continuous sensors/devices	Continuous sensors	New sensors BASIC	Future sensors & devices with Ethernet	Future sensors & devices with Ethernet
					
Industry	Process automation	Process automation	Factory automation	Process automation	Visualisation and diagnosis

What is the performance of Ethernet
APL?

Performance

Specifications VEGAPULS 6X 80-GHz Ethernet APL

	VEGAPULS 6X Ethernet-APL	VEGAPULS 6X 4 ... 20 mA/HART
Transmission rate	APL: 10 Mbit/s = 10 000 kbit/s	HART: 1.2 kbit/s
Sampling rate	10 measurements/s	4 measurements/s
Operation	<p>Standard operation:</p> <ul style="list-style-type: none">- DTM via serial interface- PLICSCOM- App via Bluetooth <p>High-performance operation:</p> <ul style="list-style-type: none">- FDI package- DTM via network- Web server	<p>Standard operation:</p> <ul style="list-style-type: none">- DTM via serial interface- PLICSCOM- App via Bluetooth- FDI package

What adjustment options are available?

Web browser



Web browser

