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Industrial Ethernet Facts

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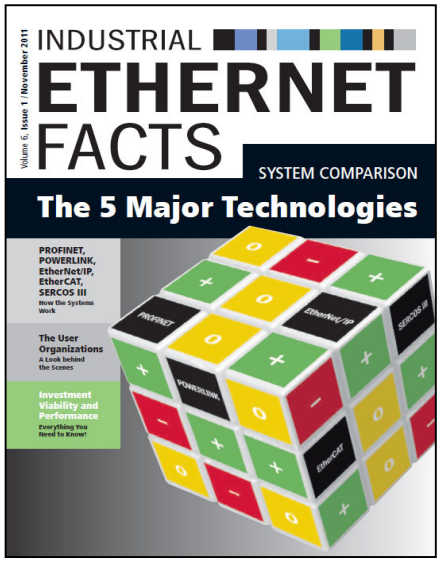
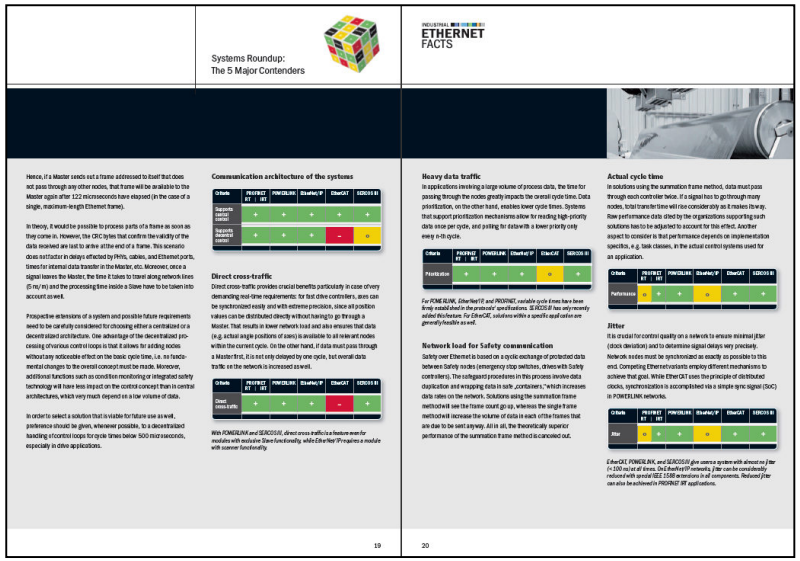
Application Engineer

Industrial Ethernet

Industrial Ethernet Facts

- Comparison of 5 major Industrial Ethernet technologies
- Available at http://www.ethernet-powerlink.org/

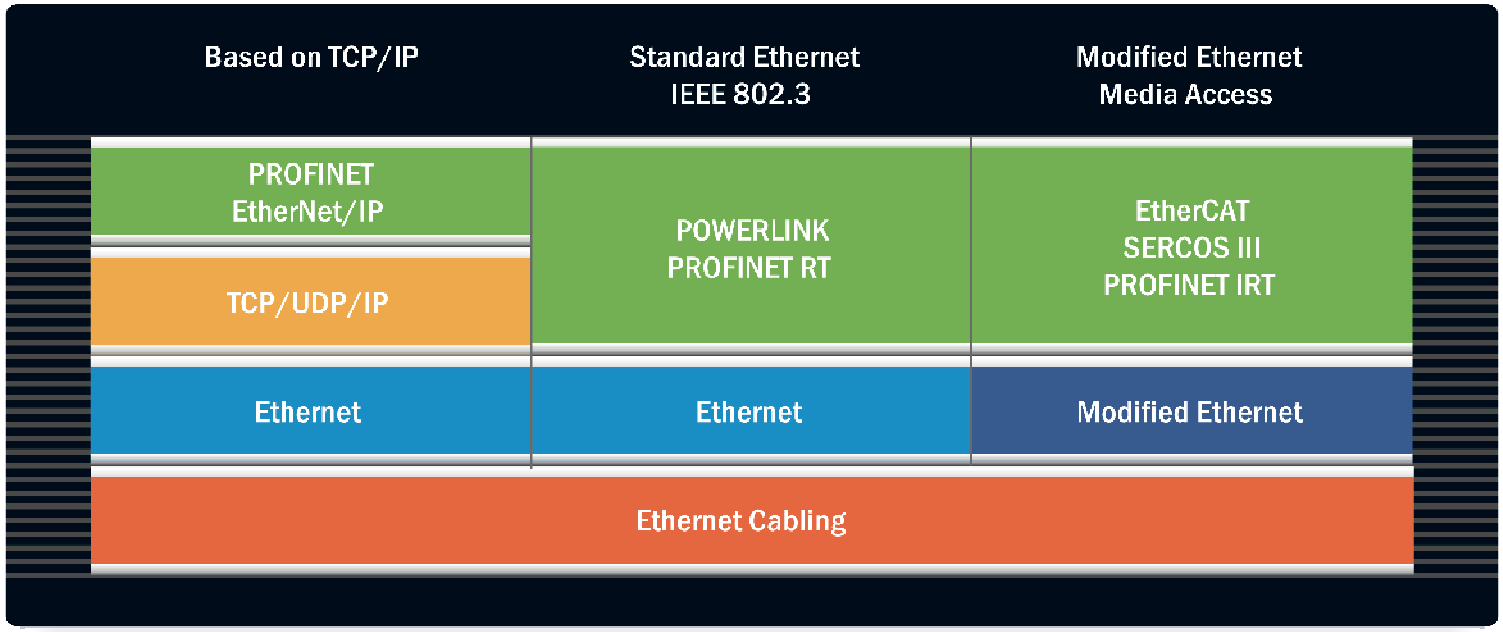




Industrial Ethernet

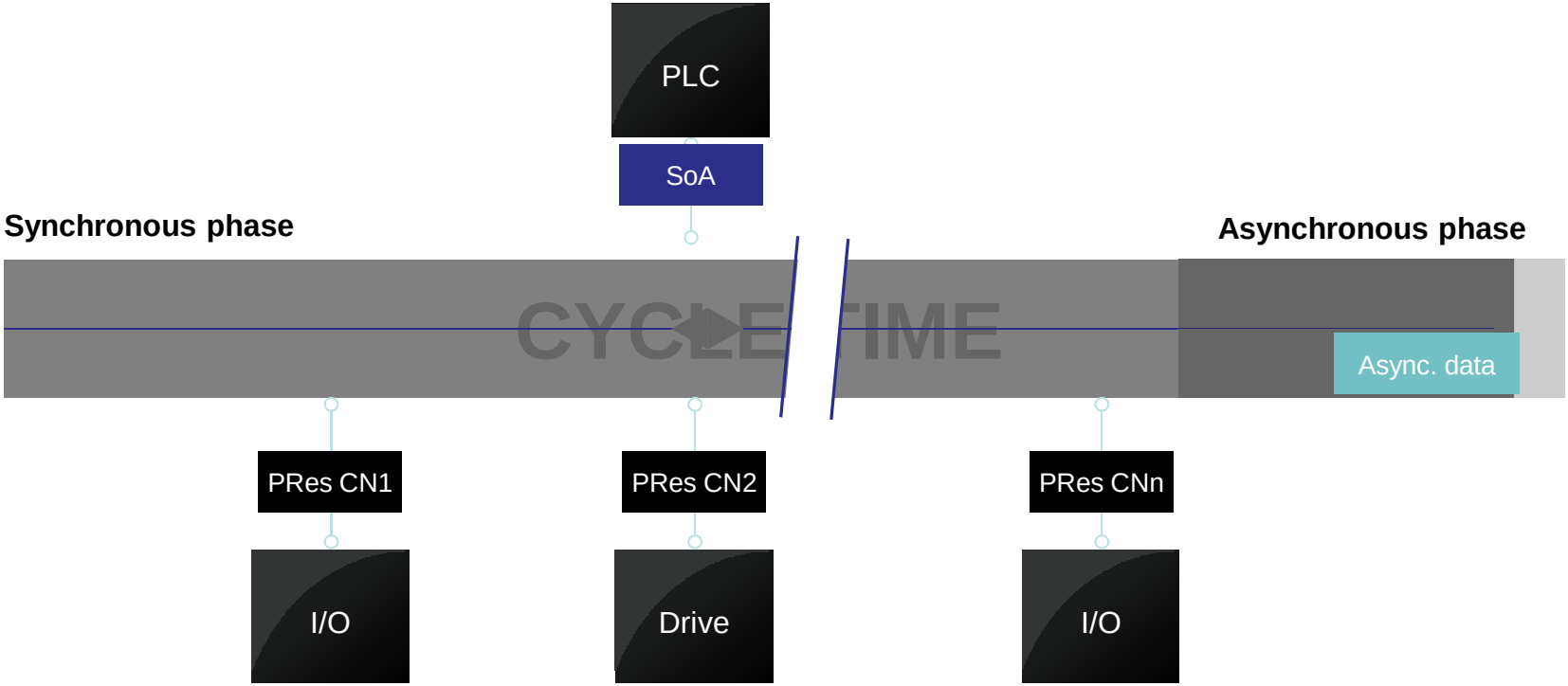
5 Major Technologies

- PROFINET
- POWERLINK
- EtherNet/IP
- EtherCAT
- SERCOS III



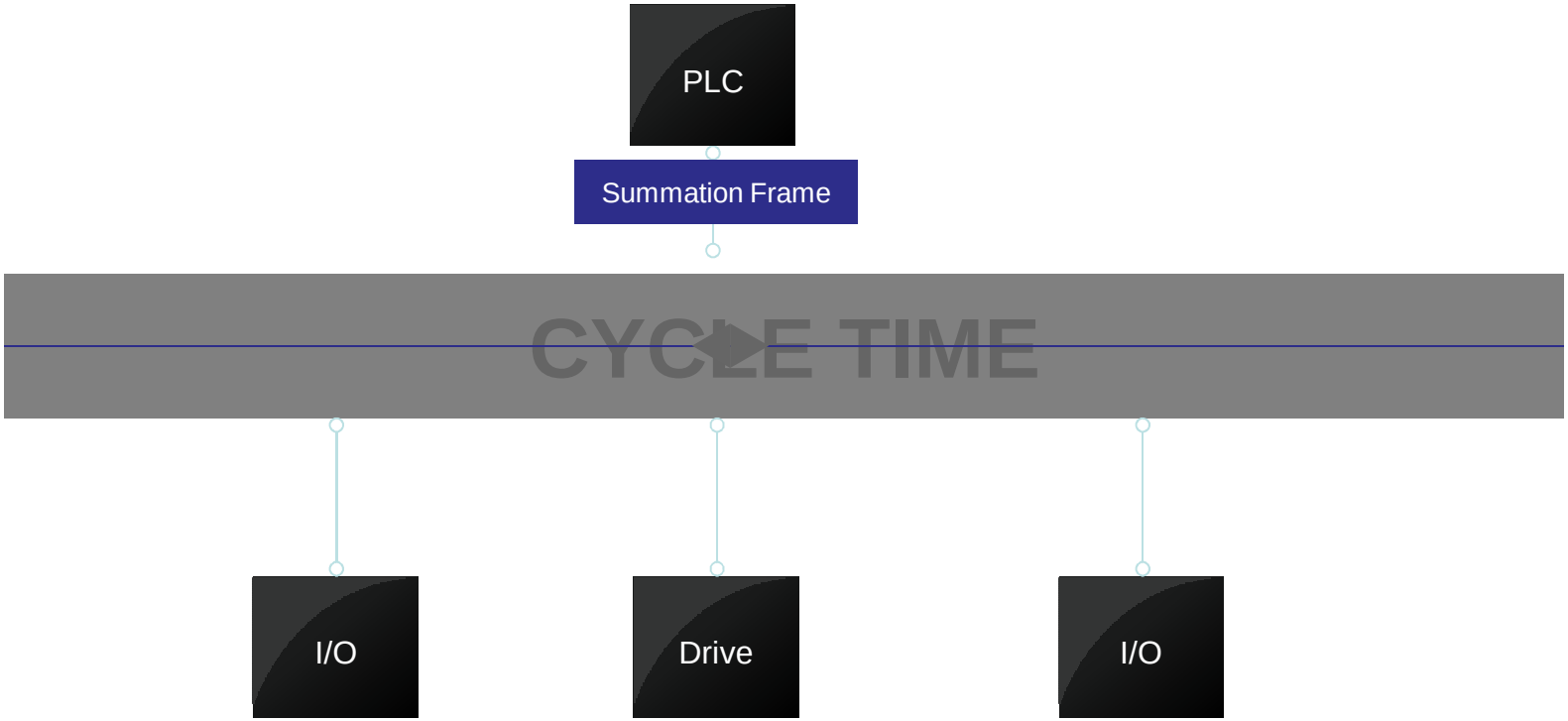
Single frame

- **PROFINET, EtherNet/IP, POWERLINK**
- **Polling mechanism**
- **Network synchronizes on SoC**

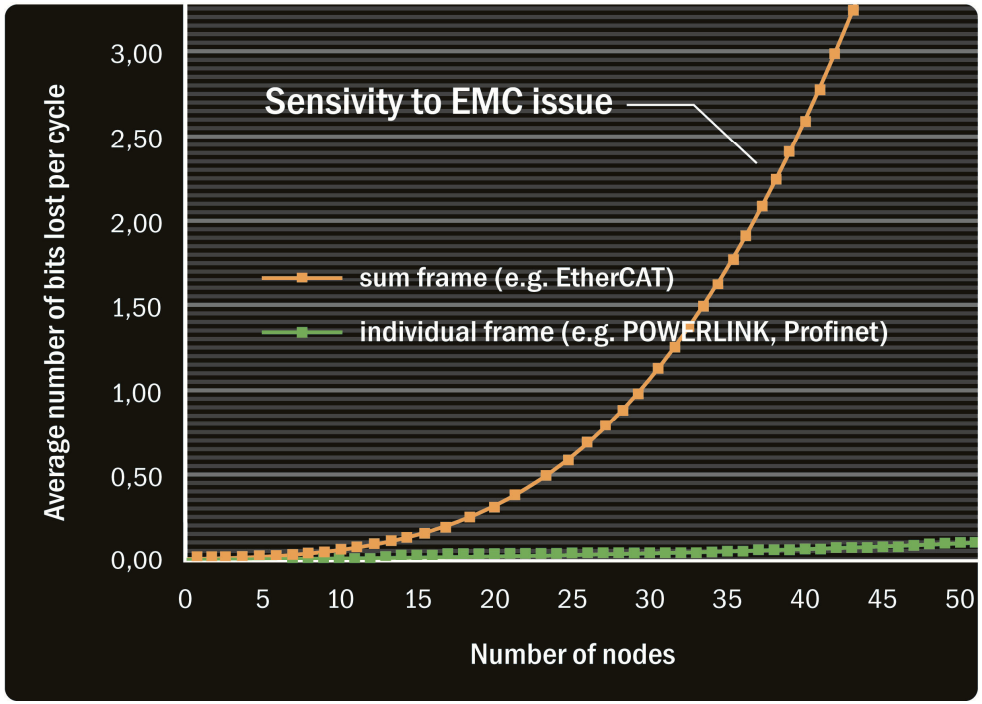


Summation frame

- **EtherCAT, SERCOS III**
- **One frame for all information (synchronous / isonchronous)**
- **Network is synchonized on bootup**



EMC Reliability



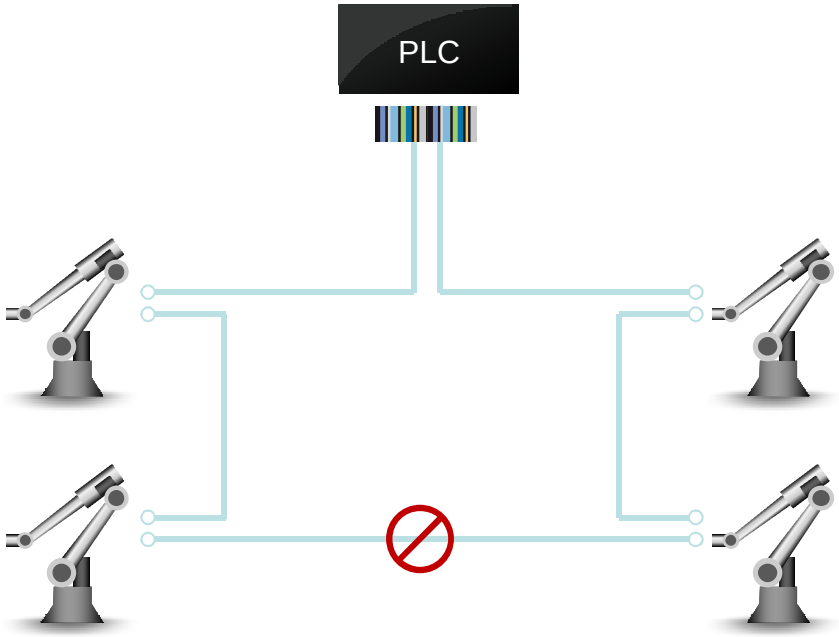
Criteria	PROFINET RT | IRT	POWERLINK	EtherNet/IP	EtherCAT	SERCOS III
EMC susceptibility	+	+	+	o	o

Cabling Topology

Criteria	PROFINET RT | IRT	POWERLINK	EtherNet/IP	EtherCAT	SERCOS III
Tree topology	+	+	+	o	o
Star topology	+	+	+	o	o
Ring topology	+	+	+	+	+
Daisy-chain topology	+	+	+	+	+

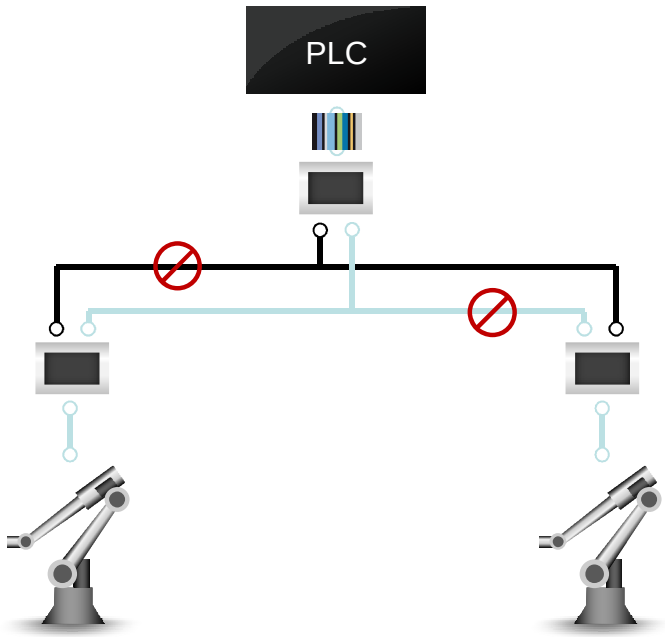
Redundancy – Basics

- Ring redundancy



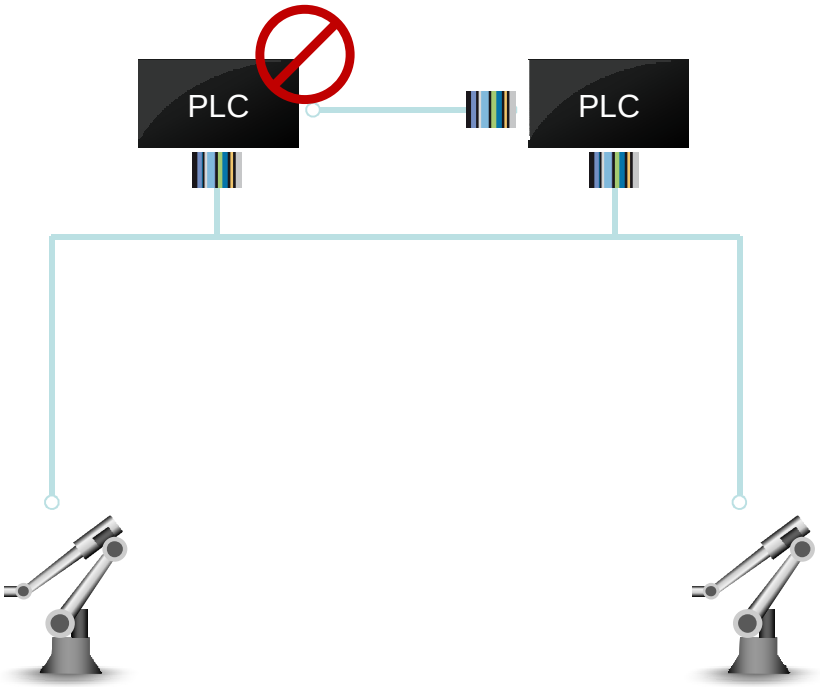
Redundancy – Basics

- Cable redundancy



Redundancy – Basics

- Redundant master



Redundancy

Criteria	PROFINET RT | IRT	POWERLINK	EtherNet/IP	EtherCAT	SERCOS III
Ring redundancy	o	+	o	+	+
Master and cable redundancy	o	+	o	o	–

Gigabit Readiness

Criteria	PROFINET RT	PROFINET IRT	POWERLINK	EtherNet/IP	EtherCAT	SERCOS III
Gigabit readiness	+	–	+	+	–	o

sercos International has stated that their IP core is basically Gigabit-ready.

Direct Cross-Traffic

Criteria	PROFINET RT | IRT	POWERLINK	EtherNet/IP	EtherCAT	SERCOS III
Direct cross-traffic	+	+	+	–	+

With POWERLINK and SERCOS III, direct cross-traffic is a feature even for modules that only have Slave functionality, while EtherNet/IP requires a module with scanner functionality.

Technology access

Criteria	PROFINET RT | IRT	POWERLINK	EtherNet/IP	EtherCAT	SERCOS III
Free source code for master	–	+	–	o	+
Free source code for slave	–	+	+	–	o

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Thank you for your attention

ETHERNET
POWERLINK
Standardization Group

Industrial Ethernet