POWERLINK
The standard for Industrial Ethernet
Why Ethernet

- Old fieldbus technologies are limiting new demanding applications
  - Low bandwidth
  - Limited topologies

- Ethernet is a safe investment
  - High performance, higher productivity
  - Manufacturer independent
  - Proven technology
Why real-time Industrial Ethernet

- Standard Ethernet is not deterministic
  - Designed for office application
  - Not for time critical information

- Real-time Industrial Ethernet is required for
  - Critical processes, control level and sensor systems
Why POWERLINK

- Maximum performance
- Absolute openness
- Based on Standard Ethernet
- Designed for Integrated Automation
- Lowest Total Cost of Ownership
- Worldwide leader for real-time Ethernet solutions
- 3,200 OEMs trust in POWERLINK
- More than 1,1 million POWERLINK systems installed

Source: IMS Research 2013
POWERLINK is Chinese official standard

- Industrial Ethernet National Standard GB/T-27960
How it works

- **Simplicity**
  - Basic and robust mechanism
  - No complex time synchronization
  - Adequate to industrial automation
Efficient technology

- Direct slave to slave communication
  - Fastest drive to drive reaction time
  - Centralized or decentralized architecture

- Multiplexed slot assignment
  - No need to exchange all data at fastest cycle time
  - Ideal for Integrated Automation
Efficient technology

- Poll Response Chaining
  - Position Control Loop
  - Current Control Loop
Efficient technology

- Multiple Asynchronous Send
  - Increased asynchronous bandwidth
  - Ideal for standard Ethernet traffic
Easy operation

- **Hot Plug**
  - Higher productivity, modular system concepts
  - No violation of real-time behaviour

- **Topology flexibility**
  - 100% free choice of star, tree, ring, or daisy chain
  - No limits on system extensions
Wideband networking capabilities

- POWERLINK fulfills all network requirements
  - One technology from motion to process
Everything connected to one network

- Perfect for Integrated Automation

- Pneumatics
- Visualization
- PLC
- Vision
- Robotic
- Remote I/Os
- Sensor
- Safety
- Robotic
- Motion Systems
**Performance**

- **POWERLINK** is faster than **EtherCAT** in many applications!

<table>
<thead>
<tr>
<th>Category</th>
<th>POWERLINK</th>
<th>EtherCAT</th>
<th>Cycle time [μs]</th>
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<tbody>
<tr>
<td>Motion decentralized: <strong>POWERLINK</strong></td>
<td>269.98</td>
<td>542.88</td>
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<tr>
<td>Motion decentralized: <strong>EtherCAT</strong></td>
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The fastest network in the world!

- 728 axes in **400µs**
- ... realized, not just theory!
High availability

- Ring redundancy
- Full medium redundancy
- Redundant master
- No downtime
openSAFETY

- One Safety standard for every bus system
Total Cost of Ownership

- Reduced Total Cost of Ownership
  - No license - no patents
  - Free software stack - minimum hardware cost
Electro magnetic compatibility

- New machines include numerous electronic power components
- POWERLINK has an excellent EMC immunity
Your benefits

- **OEM**
  - High performance
  - Open technology
  - Easy integration and diagnostic

- **Users**
  - Cost reduction
  - Increased productivity
  - Reduced downtime

- **Component manufacturer**
  - Enter the largest established market
  - No specific hardware required
  - Training and worldwide support available
Comparison of 5 major Industrial Ethernet technologies

Available at http://www.ethernet-powerlink.org/
POWERLINK news

ETHERNET POWERLINK
Standardization Group

www.ethernet-powerlink.org/

www.linkedin.com/groups?about=&gid=2331103
Thank you for your attention