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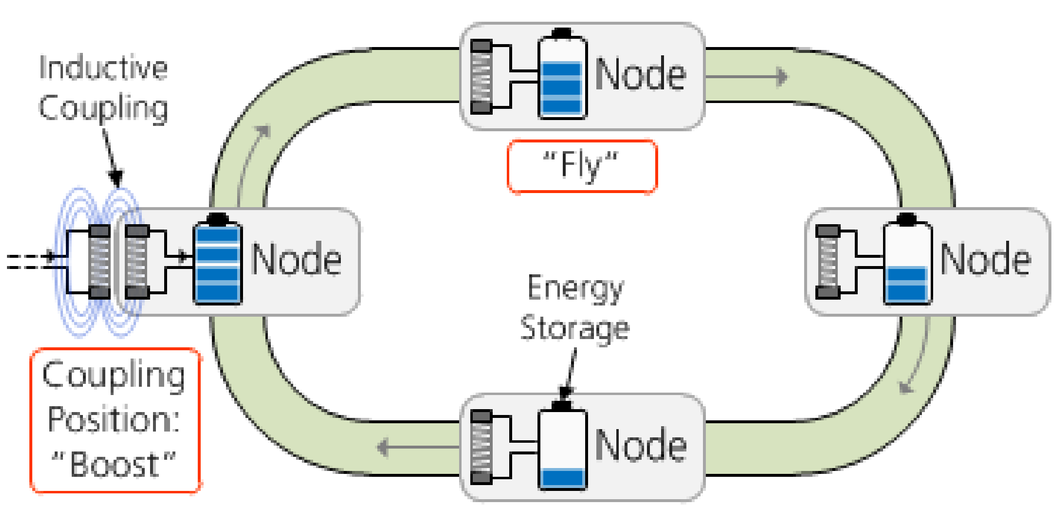
RF Powered Wireless Sensors for Industry 4.0



Abstract:

Wireless solutions for Industry 4.0 sensors are going to stay incomplete, if wireless power supply of these systems is not accessible. Energy sources, such as light energy, thermic or mechanical energy for the transformation into electrical boost & fly system energy ("Energy Harvesting"), are not sufficiently made available.
Fraunhofer IMS presents a solution for the contactless electrical quick charging ("Boost") of mobile cyber-physical systems and their energy self-sufficient operation ("Fly"). The idea is based on the thesis that cyber-physical systems (CPS) move in deterministic traces in production environments and remain on at least one position for a sufficient time to charge the energy storage ("Boost"). Then the stored energy can in the following time course supply the system with electrical energy ("Fly") again.

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Features:

- Self-sufficient operation of cyber-physical systems
- Contactless energy transfer
- Retrofitting capability (compact design and easy installation)
- High availability and robustness (industrial production environment)
- Use of available electronic components on the market

Specifications:

- Inductive energy transmission at 125 kHz
- "Boost": charging time 2 seconds
  "Fly": operation time up to 7 minutes
- Real-time capable wireless interface based on "IO-Link Wireless" standard
  - 2.4 GHz ISM band (Frequency Hopping)
  - Cycle time: 12 ms
- Demonstrator
  - Acceleration sensor (3 axes)
  - Magnetic field sensor