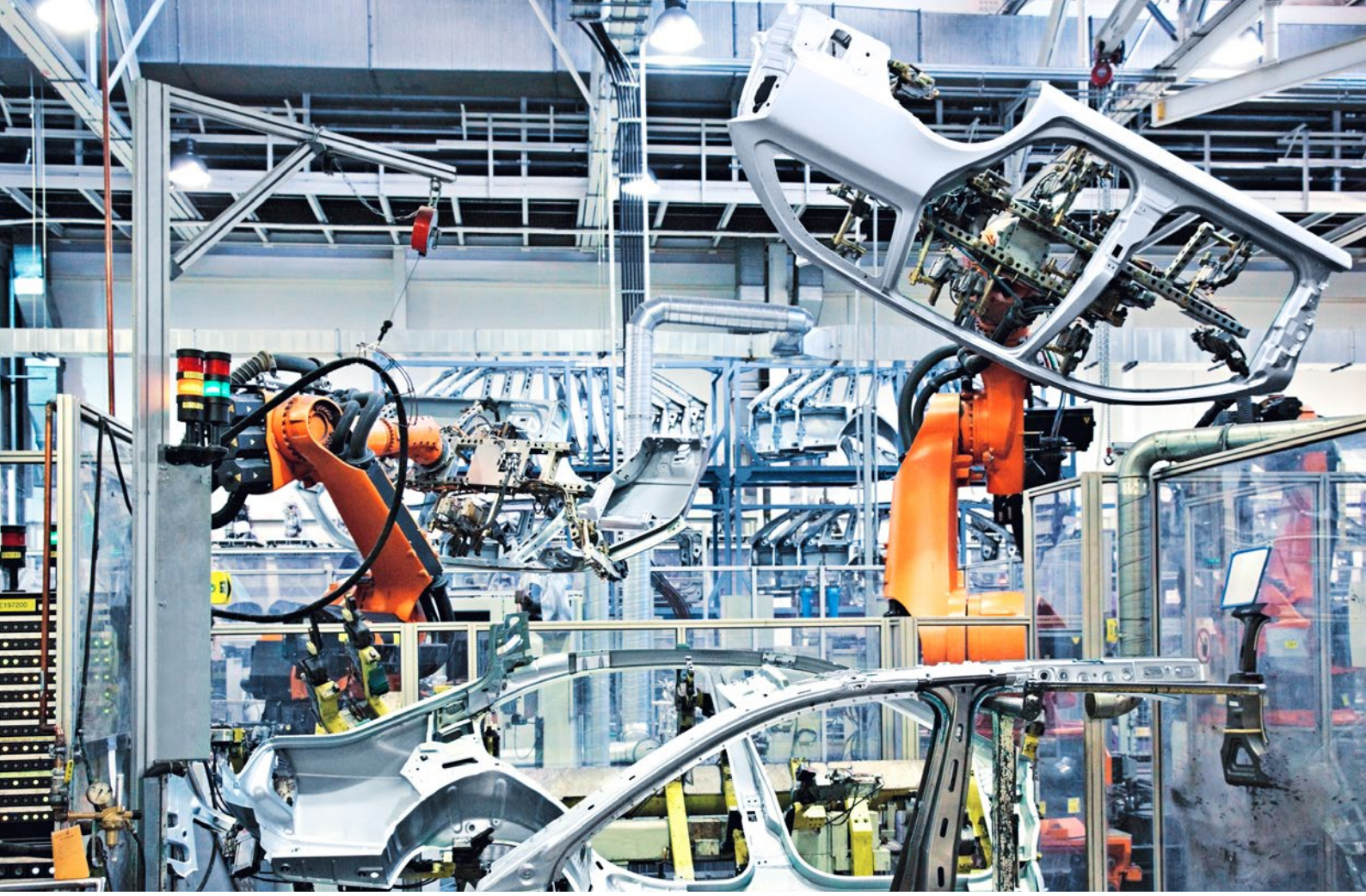


Application example

NearFi in use with robots

Contactless power and data transmission

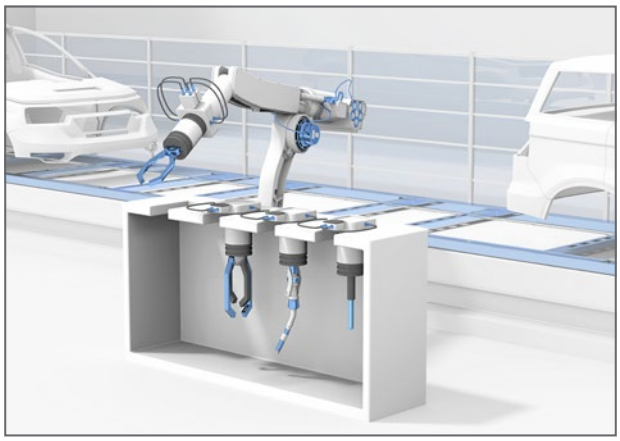
Tool changes on robots

Robot technology enables a high degree of flexibility and rapid changeover times in industrial production systems. The costs of production processes can be reduced through shorter cycle times. However, maintenance-intensive applications such as tool changes on robots cause unnecessary downtimes. The use of NearFi couplers instead of wear-prone and maintenance-intensive connectors significantly reduces downtime costs.

Application

Robots are being developed with ever more capabilities for controlling the various tools automatically. For example, mobile robotic stations are equipped with various attachments, grippers, quick-change systems, and programs and can be used at various locations in the factory as required to implement the appropriate workflows.

With increasing automation in the automotive industry, hundreds of mating cycles are made between a robot arm and its exchangeable tool every day – an enormous challenge on the components used.



Tool change on an industrial robot

The challenge

When connections have to be plugged and unplugged often, the contacts may become dirty and misshapen. This leads to unplanned or unforeseeable production stoppages and frequent maintenance intervals, the costs of which can quickly reach seven figures.

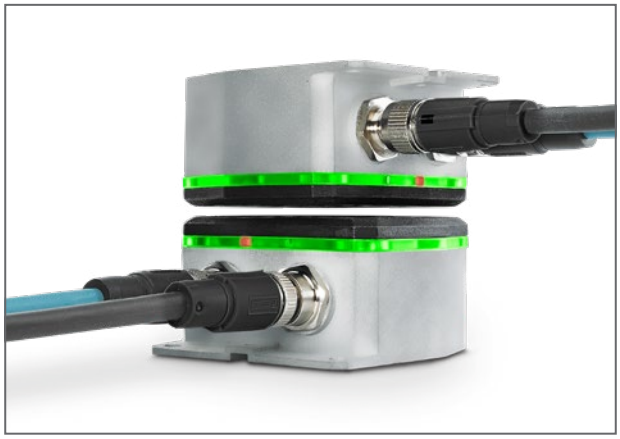
All of the available solutions thus far have either not performed adequately, have been prone to errors, or have required intensive maintenance thereby making operation expensive.

Faulty connectors can cause production downtimes

The solution

NearFi couplers transmit power and real-time Ethernet data across an air gap of a few centimeters. The couplers do not need to be configured and are as easy to use as a connector.

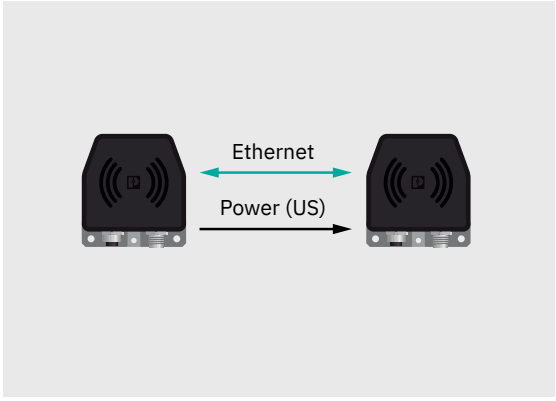
Because power begins to be transmitted between the NearFi couplers on the robot and gripping tool even as they are approaching each other, it is possible to realize fast Ethernet communication startup at a rate of less than 500 ms (fast startup). This means that the cycle time can be reduced significantly compared to slow mechanical contacting with connectors.



NearFi couplers for contactless power and data transmission

Contact-free transmission of Ethernet data and communications/ sensor power (US)

The base coupler is installed on the robot arm and typically connected to a PROFINET PLC and a 24 V power supply. The remote coupler is positioned on each tool and typically connected to a PROFINET IO module that has digital inputs for detecting the gripper positions. The power and data are transmitted between the robot and the gripping tool without contact via NearFi.



Power and data transmission

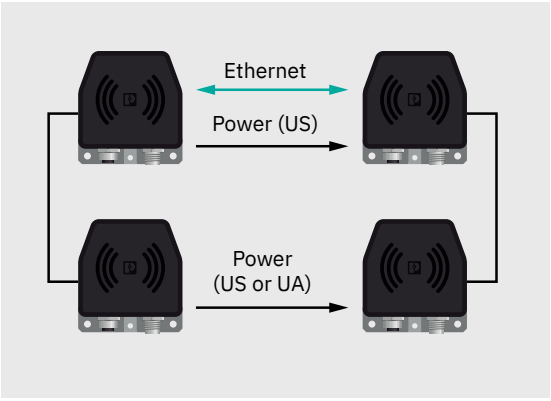
Recommended products

With NearFi couplers, power (50 W, 24 V DC/2 A) and real-time Ethernet data (100 Mbps, full duplex) can be transmitted across an air gap of a few centimeters.

1433050 NEARFI 2200 B
1433049 NEARFI 2200 R

Contactless Ethernet data, communications/sensor power (US), and actuator power (UA) transmission

The base couplers are installed on the robot arm and typically connected to a PROFINET PLC and 24 V power supply. As a counterpart, the remote couplers are positioned on the tool and usually connected to a PROFINET IO module that has digital inputs and outputs. The safety functions are adopted from higher-level safety modules/relays. Two electrically isolated power supplies and the transmission of data between the control devices and the I/O module are realized via NearFi without contact. This means that the actuator voltage can be switched off in compliance with safety requirements.



Power and data transmission in parallel operation

Recommended products

With NearFi couplers, power (50 W, 24 V DC/2 A) and real-time Ethernet data (100 Mbps, full duplex) can be transmitted across an air gap of a few centimeters. In conjunction with NEARFI 300, two electrically isolated powers (2 x 50 W, US, and UA) can be transmitted.

1433050 NEARFI 2200 B
1433049 NEARFI 2200 R
1464614 NEARFI 300 B
1509989 NEARFI 300 R

Contact

Do you have any further questions about the NearFi couplers or our NearFi technology? Contact us for more information, we will be glad to advise you.

Find out more about our NearFi products:

› phoe.co/NearFi-coupler

Found out more about our NearFi technology:

› phoe.co/NearFi

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