



# Testing the DAC in Operation throughout Europe

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Bundesministerium  
für Digitales  
und Verkehr

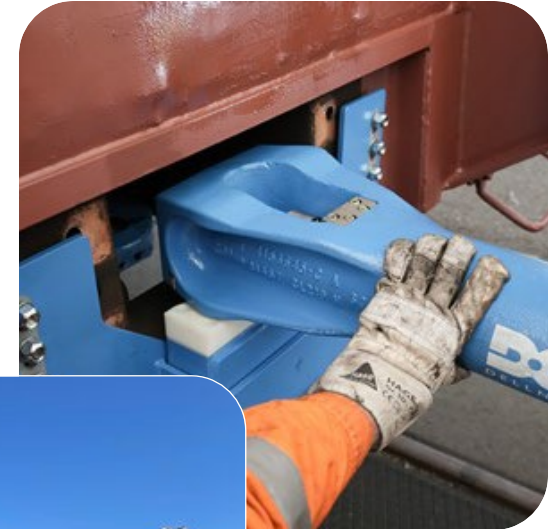
# Digital Automatic Coupler (DAC) strengthens rail freight transport as the backbone of the economy



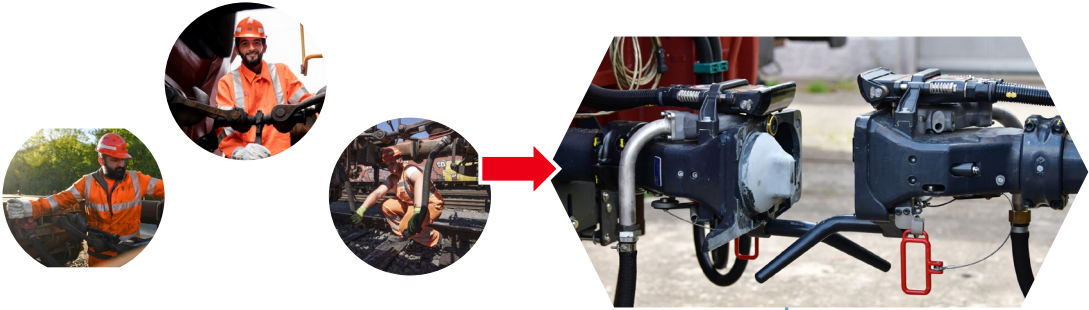
- It enables **longer, heavier, faster freight trains**, as well as **faster train dispatching in facilities**. In this way, an **increase in capacity of up to 15%** can be achieved in the existing infrastructure.
- Automation of train formation and brake tests still allow logistics services with **shunting despite skilled labour shortage**. It creates more **attractive working conditions** through less physical stress and a modern working environment.
- The DAC **massively reduces the time** required for the formation and departure of each train, since manual coupling and many other time-consuming manual steps on each individual wagon are automated. **This makes the single car system faster, more robust and more flexible.**

## Current project insights:

Test for a pop-up workshop near a customer – so that the wagons can be returned to the customer quickly after the conversion



# A Variety of Effects will make the DAC a Game Changer in Rail Freight Transport in Europe

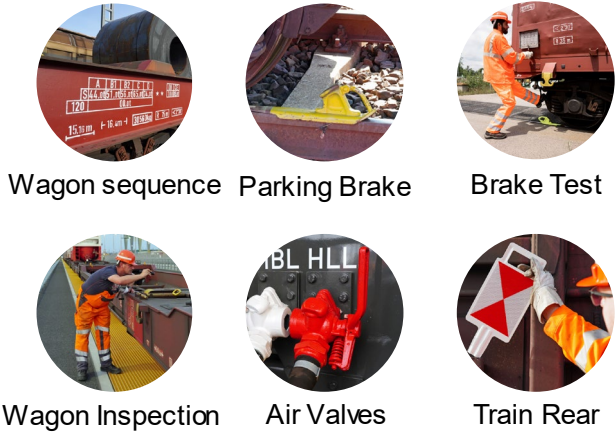


**The Basis:**  
Mechanical and pneumatical connections plus power and data line for faster and easier processes

**Shunting and Train Preparation**  
easy, fast and efficient

**Train Run**  
heavier, faster, longer

**Logistics of the Future:**  
Added value for the processes of customers and shippers



# Project Overview

## Schedule

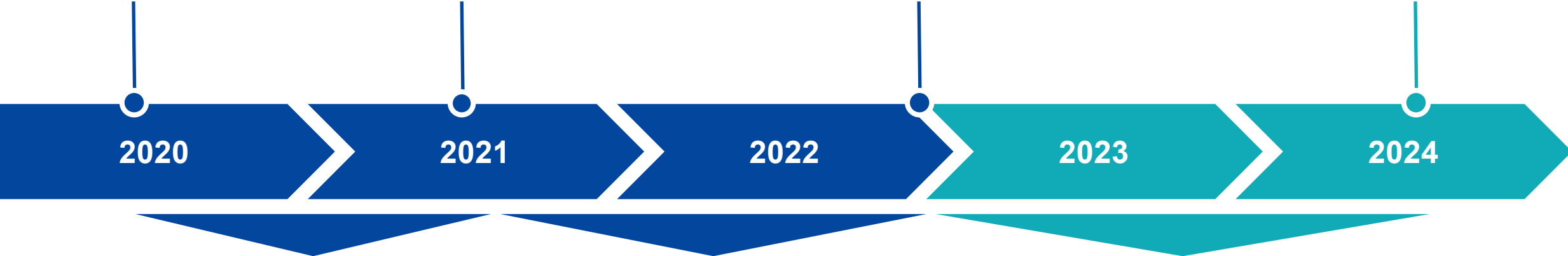


Start of project & modification of wagons

Decision for coupler head design

Finalization Phase II – Operational Testing

Finalization of project



**Phase I**  
Tests of 4 coupler designs

**Phase II**  
Testing in real operational scenarios

**Phase III & IV**

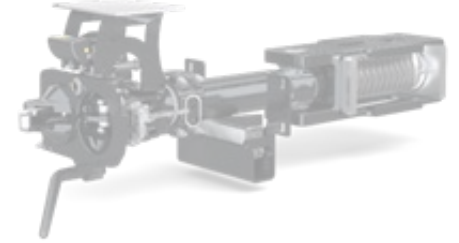
- extension of the initial project
- necessary for further development of designs

# Phase I – Design Evaluation

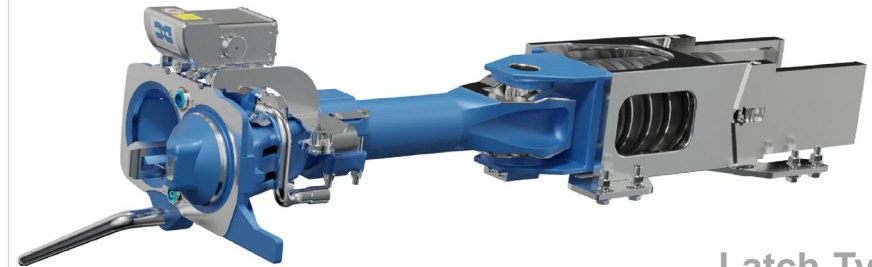
## Configuration



Generation 1



Generation 2

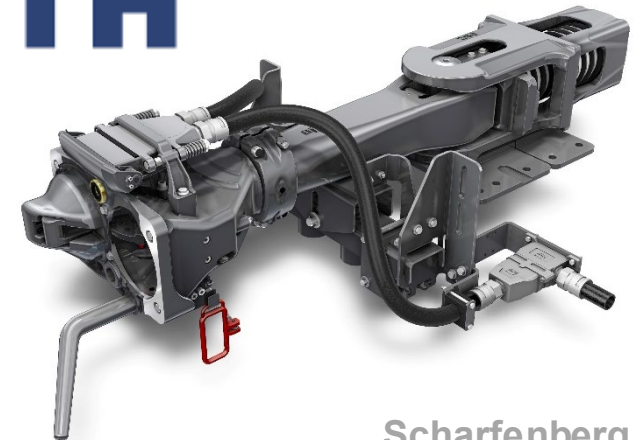


Latch-Type

SA3



Schwab



Scharfenberg

# Phase I – Design Evaluation

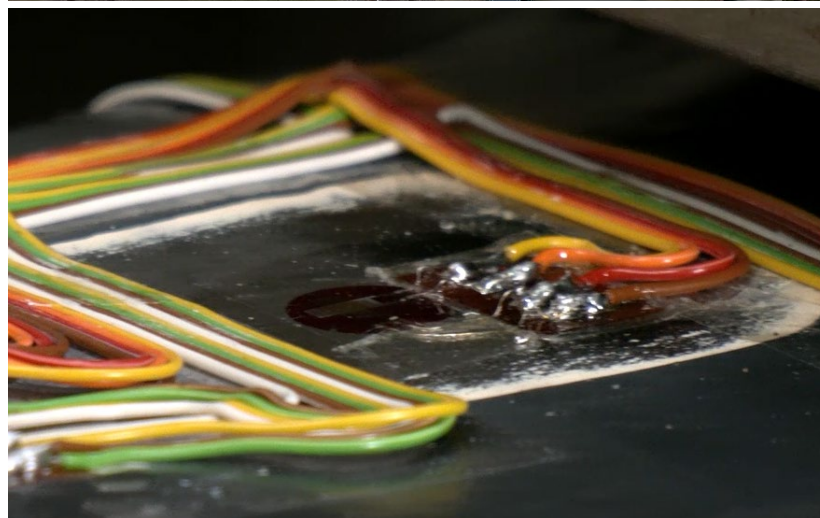
## Single Coupler Tests

- dedicated test site
- climate chamber
  - dry and wet
  - -25°C to +40°C
  - snow and ice

## Outcome:

- 2000 individual tests
- 200 climate tests

→ for KO-workshops EDDP



# Phase I – Design Evaluation

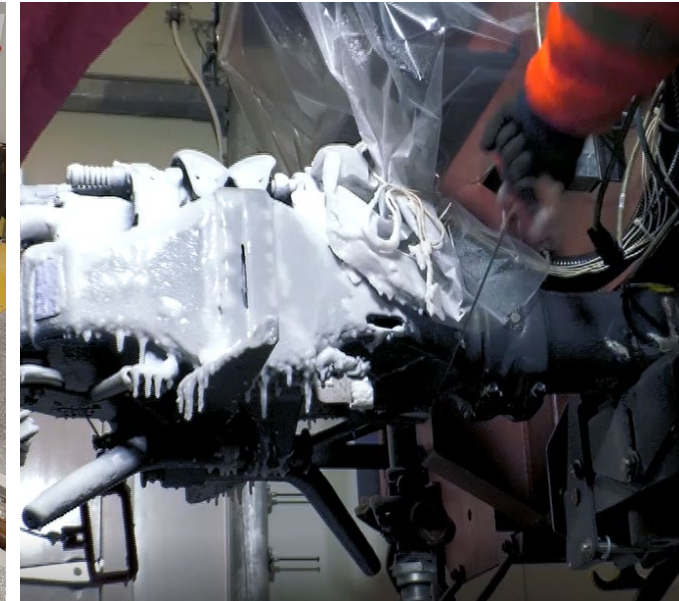
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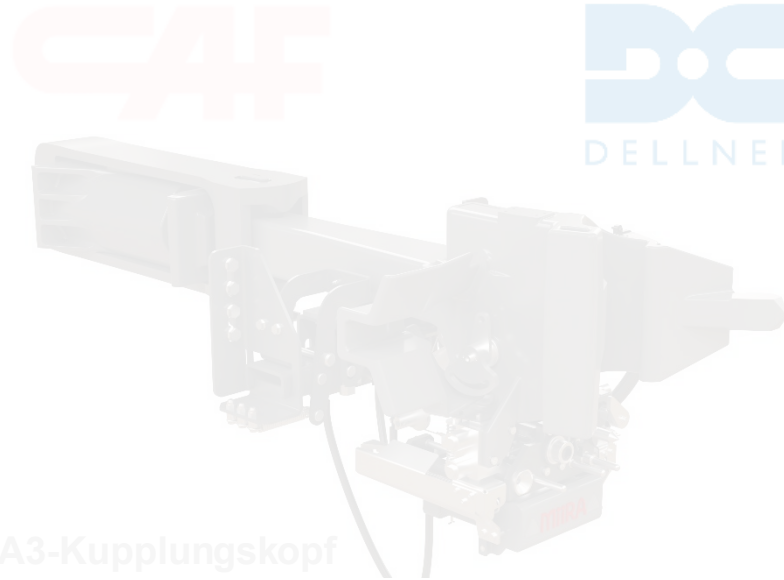
# Phase II – Operational Testing

## Coupler Configuration

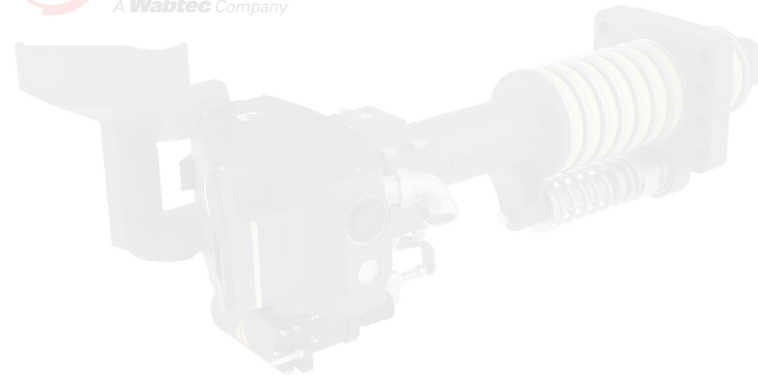


### Decided for the Latch-Type / Scharfenberg Coupler Head

- 84 organizations
- > 232 participants
- from 20 countries



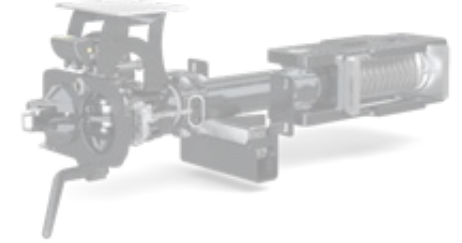
SA3-Kupplungskopf



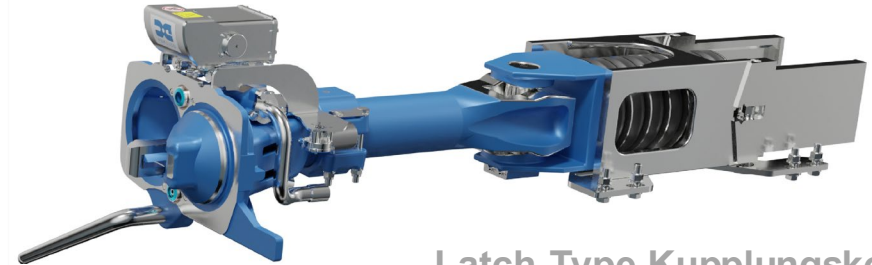
Schwab-Kupplungskopf



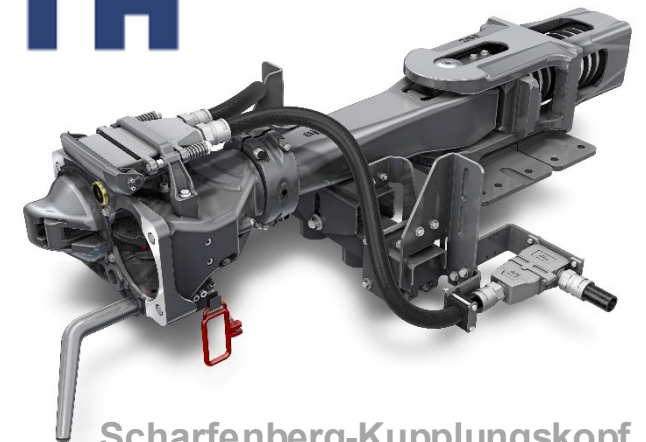
Generation 1



Generation 2



Latch-Type-Kupplungskopf



Scharfenberg-Kupplungskopf



# Phase II – Operational Testing

## Wagon Composition



Eanos x-059



EX90 Fanps



Zags 119



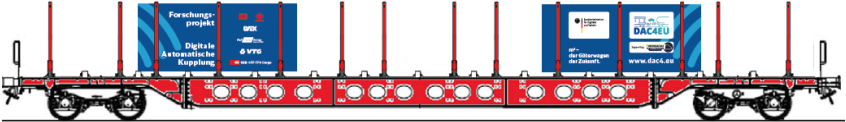
Sgmmns 40



Hbbins 306



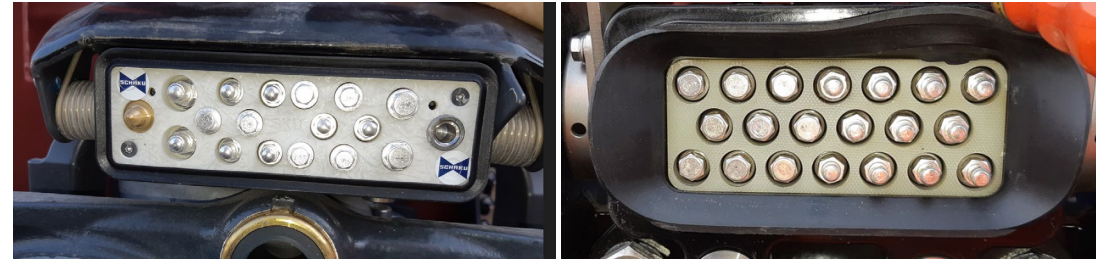
m<sup>2</sup> -wagon



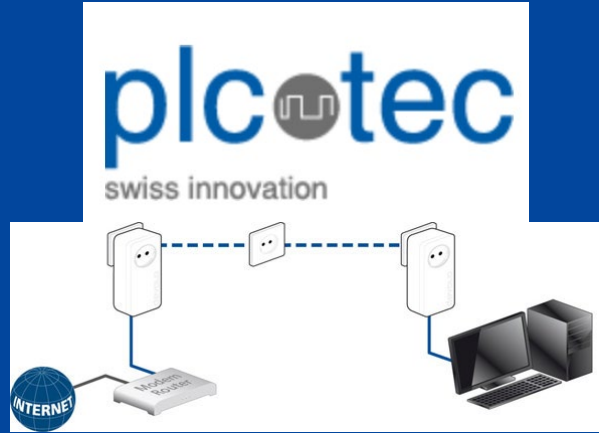
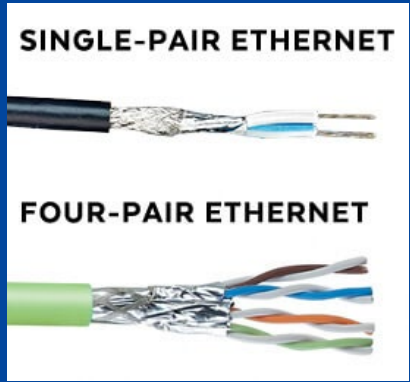

# Phase II – Operational Testing

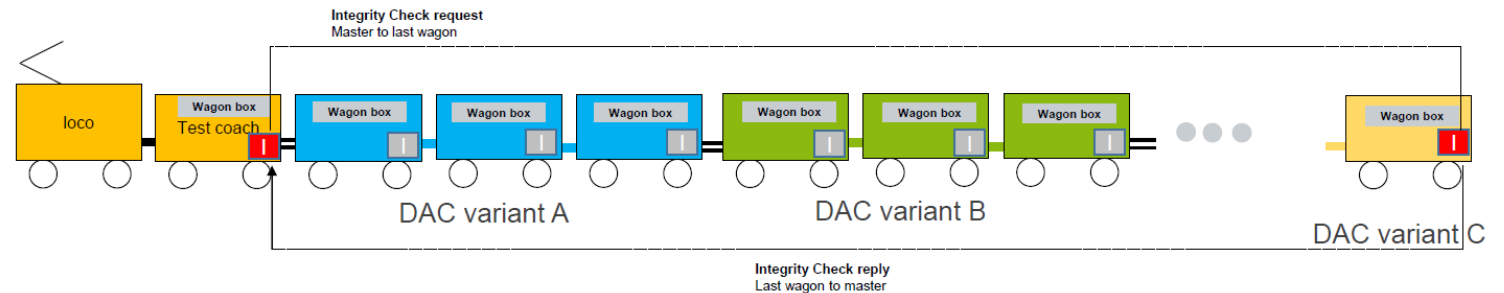
## Results Power Transmission & Data Communication

- establishing of stable connection
- physical behavior of electric connection



- performance and reliability
- show cases for:
  - train integrity
  - train inauguration
  - wagon order and direction
  - ...

Powerline	SP Ethernet	Wireless
		



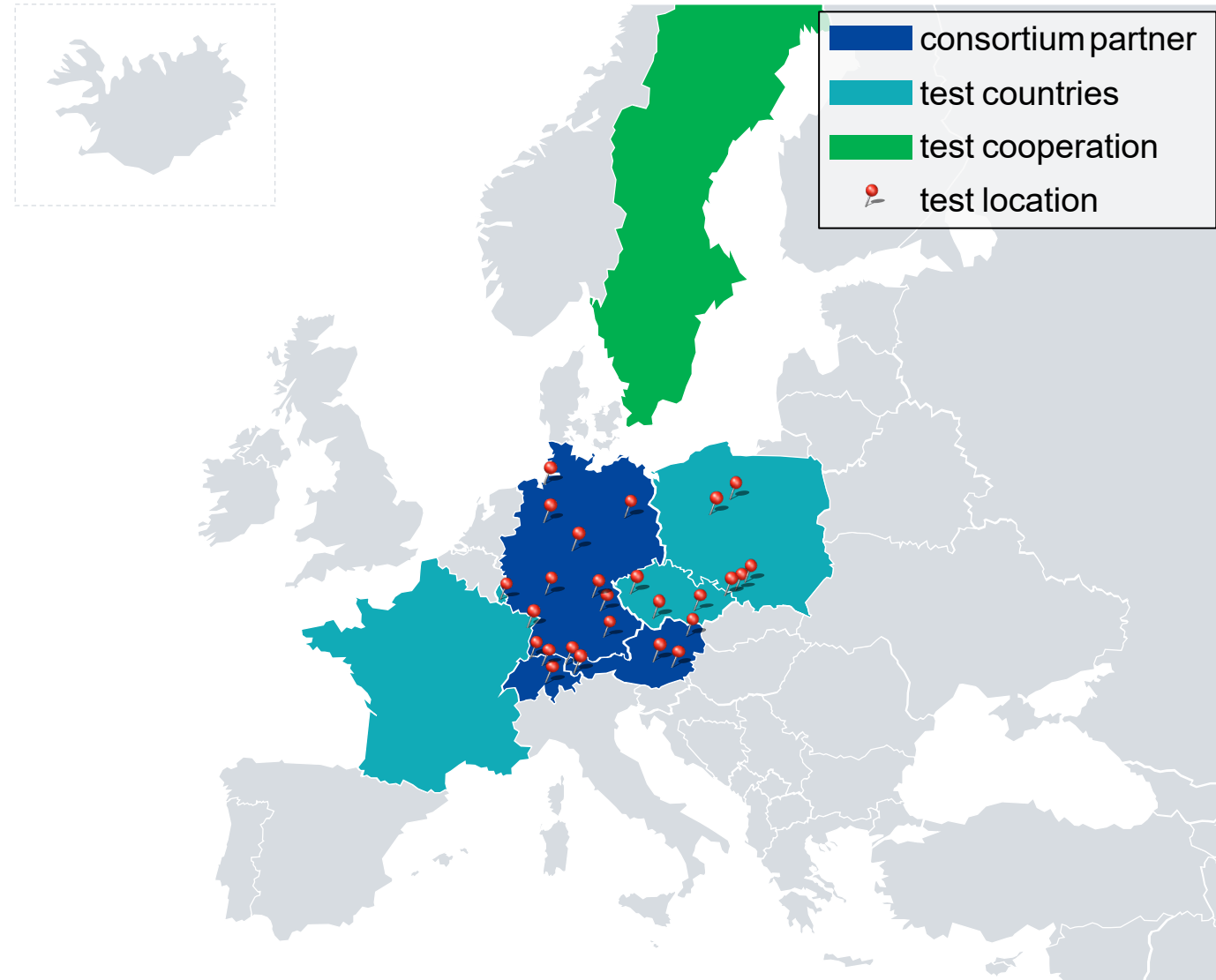
# Phase II – Operational Testing

## Testing in Europe



- over 25 test locations in 7 countries
- tests in France and Luxembourg planned for end 2022
- close exchange with Trafikverket (Sweden)
  - winter tests
  - high mileage testing

→ **Operational requirements for DAC all over Europe**



# Phase II – Operational Testing

## Test Scenarios



### Test Runs

- representative or special tracks
- wagon and coupler behavior
- energy and data transmission

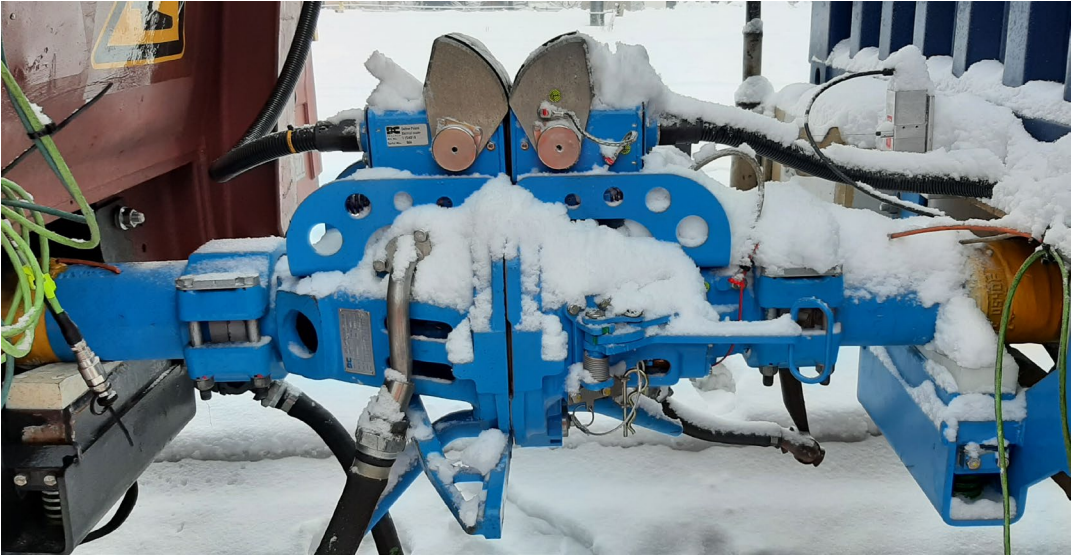
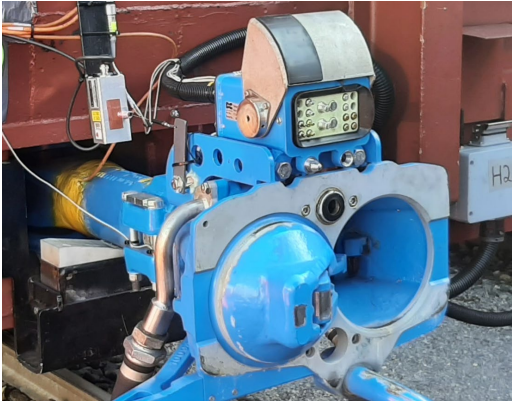
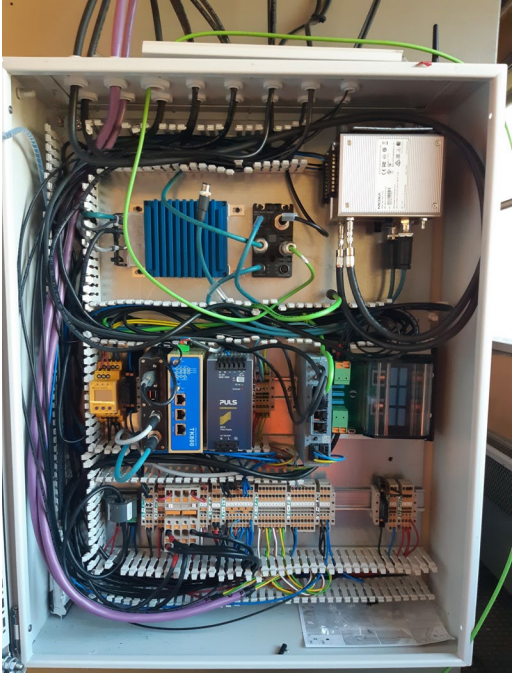
### Shunting

- shunting
- coupling and uncoupling
- shunting with hump



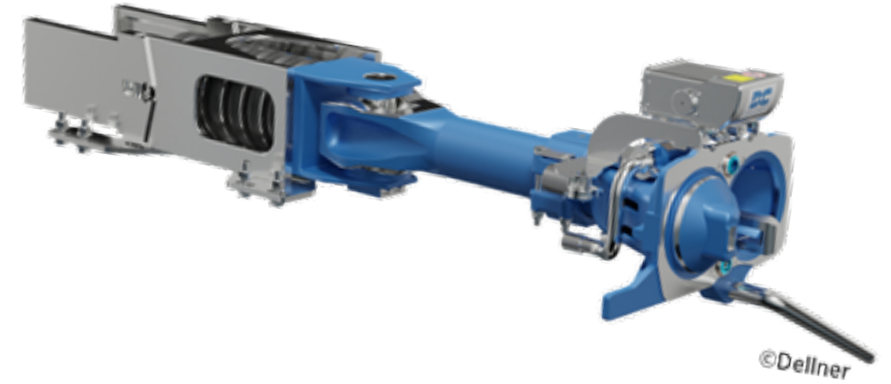
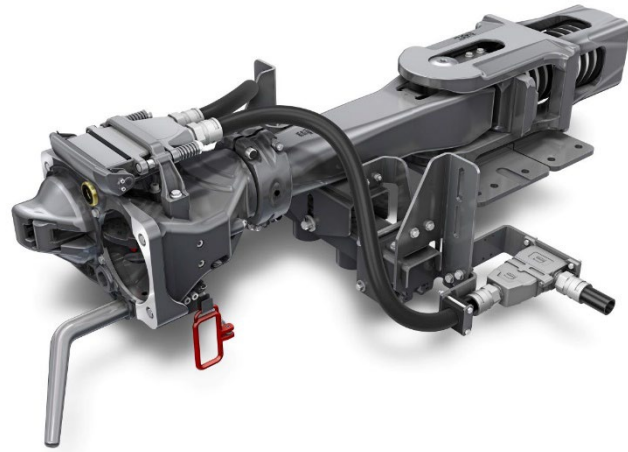
# Phase II – Operational Testing

## Impressions





Bundesministerium  
für Digitales  
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## Contact

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SBB CFF FFS Cargo

