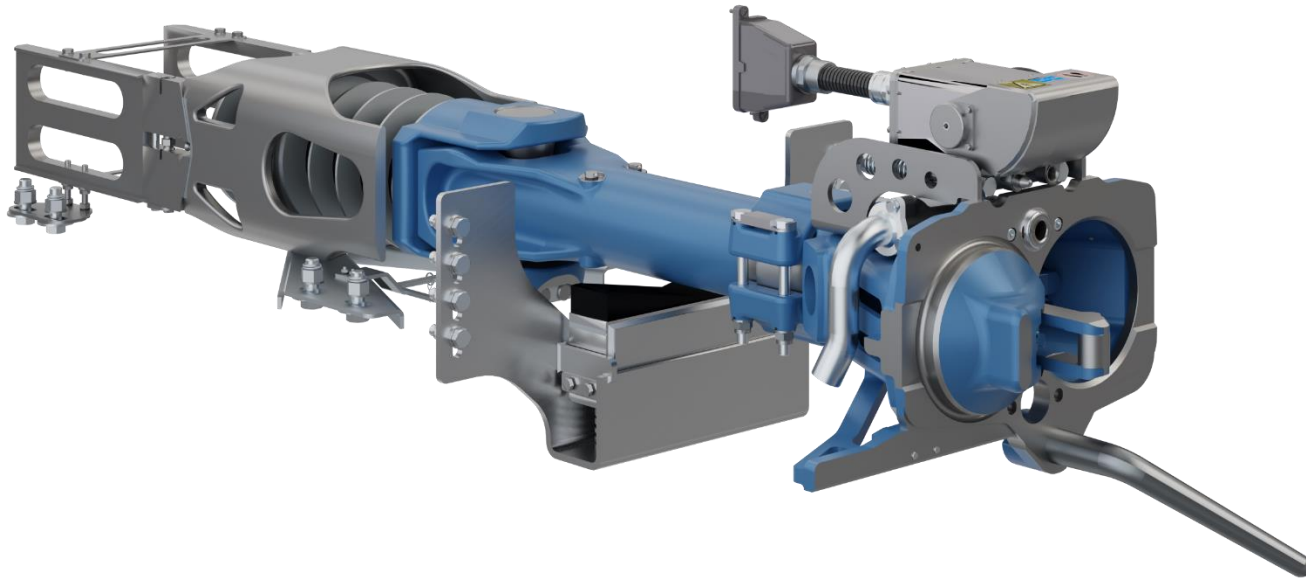




TRAIN  
CONNECTION  
SYSTEMS

## DELLNER DAC COUPLERS





# Dellner Background



Company **HQ** in Falun,  
Sweden



**22** production and  
service subsidiaries in  
**16** countries



More than **1200**  
employees



Global market leader in  
producing  
**Train Connection  
Systems**



Products for all train  
applications



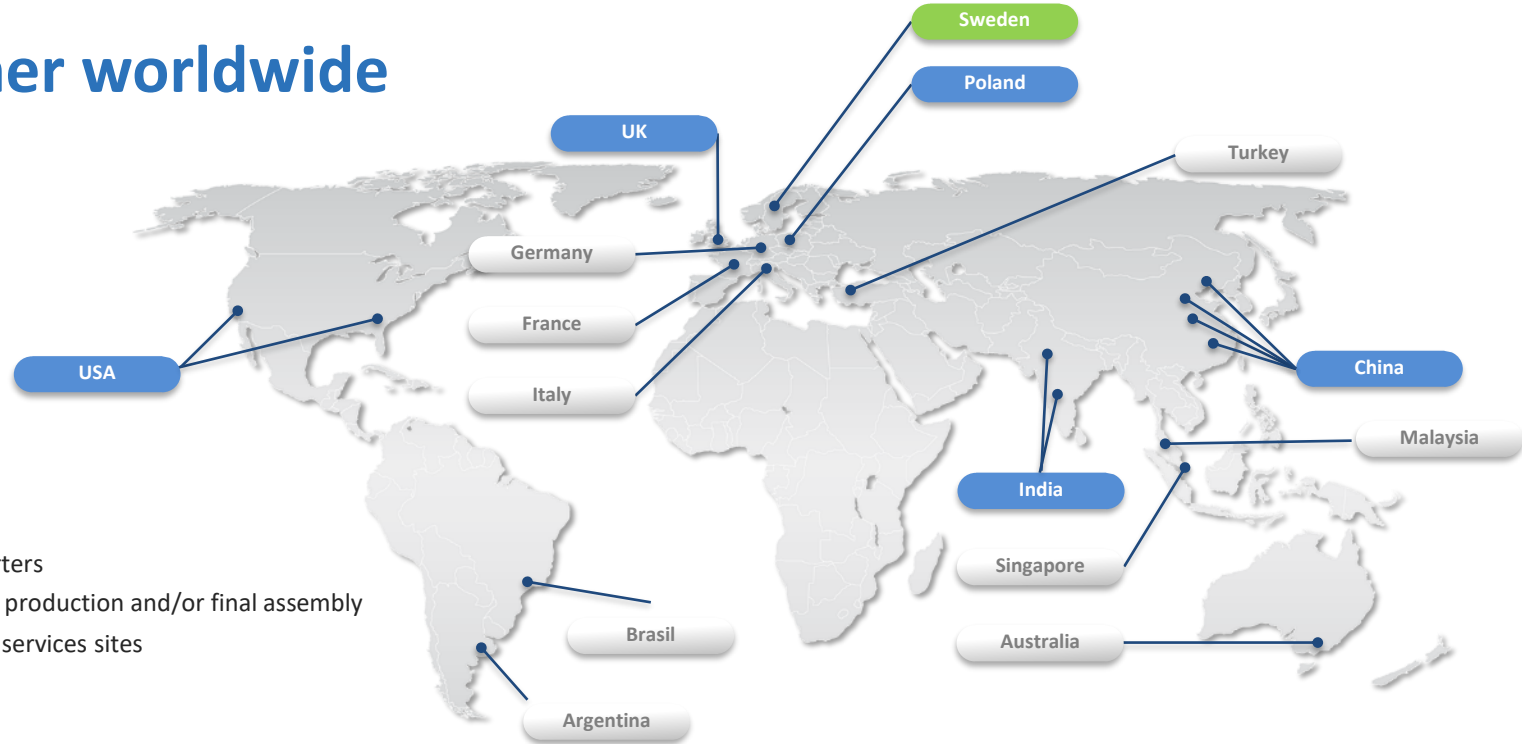
**Dedicated** solutions for  
train builder, operators  
and maintainers



**Excellent** global after  
sale support



# Dellner worldwide



- Headquarters
- Sites with production and/or final assembly
- Sales and services sites

## Main sites overview



**Sweden, Falun, 1941**  
**Headquarters** -couplers assembly and aftermarket. Center of excellence for couplers engineering.



**Charlotte, USA,**  
Couplers assembly and aftermarket.



**Chennai, India**  
Gangways and coupler assembly and aftermarket.



**Miszewko, Poland, 2020**  
Machinery production, couplers assembly and aftermarket. Main site for subcomponents production and couplers assembly.



**Swadlincote, UK**  
Gangways production and assembly, couplers production and assembly. Center of excellence for gangways.



**Flen, Sweden**  
Headquarters for Dellner Dampers. Center of excellence for dampers.

# Train Connection Systems

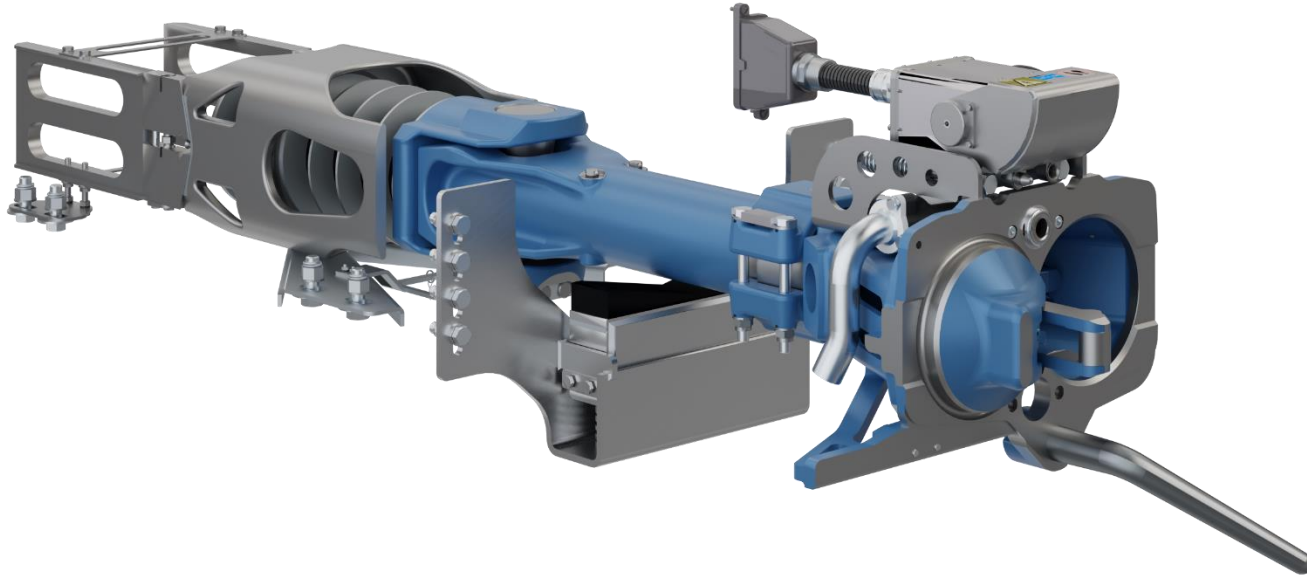
## INTERMEDIATE SYSTEMS:

- Gangways
- Semi-permanent couplers
- Articulation joints
- Dampers
- Crash Energy Management



## FRONT SYSTEMS:

- Automatic couplers
- Foldable Albert couplers
- Data Transmission Products
- Adapters
- Coupler Protection Products
- Dampers
- Crash Energy Management



EUROPEAN DAC  
DELIVERY PROGRAMME  
Enabled by 30072048



### MAIN BENEFITS OF THE DELLNER DAC:

LATCH TYPE COUPLER HEAD  
PROVEN IN PASSANGER TRANSPORT

MODULAR DESIGN

CUSTOMISABLE

UIC530-1 COMPATIBLE

RELIABLE AND ROBUST

LOW LCC

EASY MAINTENANCE

INCREASED SAFETY IN COUPLING  
AND UNCOUPLING

EASY AND FAST INSTALLATION

DIGITAL FUNCTIONALITIES



### DELLNER DAC- TECHNICAL DATA

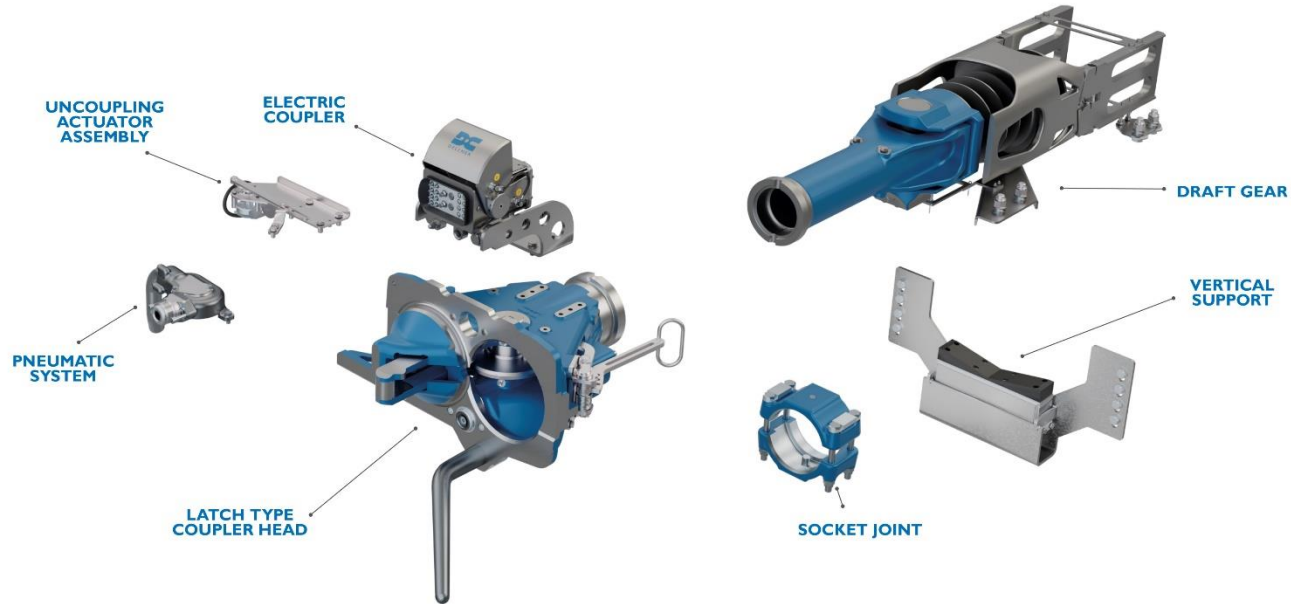
EUROPEAN DAC  
DELIVERY PROGRAMME  
*Enabled by Shift2Rail*



CHARACTERISTICS	VALUE	IN COMPLIANCE WITH	REMARKS
Strength, draft	1000 kN (Yield strength) / ≥ 1500 kN (Ultimate strength)	EN12663, UIC530-1, UIC522	
Strength, buff	2000 kN (Yield strength)	EN12663, UIC530-1, UIC522	
Horizontal angle	±17° at -50 mm stroke, ±12° from -50 mm to -110 mm stroke	UIC530-1	
Vertical angle	±9° at -50 mm stroke, ±4° from -50 mm to -110 mm stroke	UIC530-1	
Min. coupling speed	0,5 km/h		
Max. coupling speed	Up to 12 km/h		Recommended < 6 km/h
Draft gear interface	Acc. To UIC530-1	UIC530-1	
Pivot to coupler face	Min. 1025 mm	UIC530-1	
Gathering range, horizontal	-275 mm / +370 mm	EN16019/TSI HGV, UIC522	
Gathering range, vertical	±140 mm	EN16019/TSI HGV, UIC522	
Coupling on / movement through curved tracks, humps	Acc. To UIC522 chapter 3	UIC522	
Coupler head	Latch type 10 modified	EN16019/TSI HGV, UIC522	Visual indication of coupler locking mechanism acc. to UIC522
Uncoupling device	Manual (Automatic level 5)		
Stroke on draft	55 mm / 110 mm	UIC530-1, UIC524	55 mm acc. to UIC530-1, possible to increase to 110 mm
Stroke on buff	110 mm	UIC530-1	
Energy absorption for 110 mm stroke	Approx. 50 kJ	UIC530-1, UIC522	
Number of air connections	Up to 2		
Diameter of brake pipe	1 1/4"		
Pressure in brake pipe	Max 12 bar		
Interface of brake pipe	G1 1/4"		
Environmental conditions	-25°C to +70°C		
Fire protection class	EN45545 HL2		

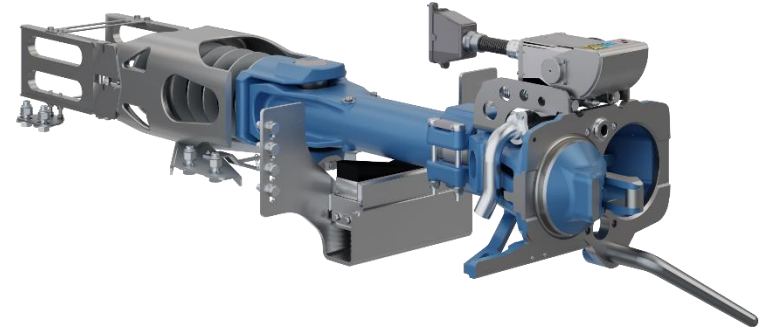
Options: Electrical coupler, automatic uncoupling, locking of manual uncoupling to prevent vandalism, MRP, front covers, Condition based monitoring

## Dellner modular couplers



## DAC4EU – Functional Levels & Automation summary

Functional level (FL)	FL 1	FL 2	FL 3	FL 4	FL 5
Mechanical connection	✓	✓	✓	✓	✓
Main brake pipe		✓	✓	✓	✓
Power line			✓	✓	✓
Data connection				✓	✓
Automatic decoupling					✓



### Definition of Functional Levels:

- **Functional level 1:** automated coupling of the mechanical connection; **manual** decoupling by pulling a lever
- **Functional level 2:** same as FL 1 **plus** automatic coupling of air pipe; **manual** decoupling by pulling a lever
- **Functional level 3:** same as FL 2 **plus** automatic coupling of electrical power line; **manual** decoupling by pulling a lever
- **Functional level 4:** same as FL 3 **plus** automatic coupling of data line; **manual** decoupling by pulling a lever
- **Functional level 5:** same as FL 4 **plus** fully automated decoupling (remote controlled) of all previous systems

## Level 1



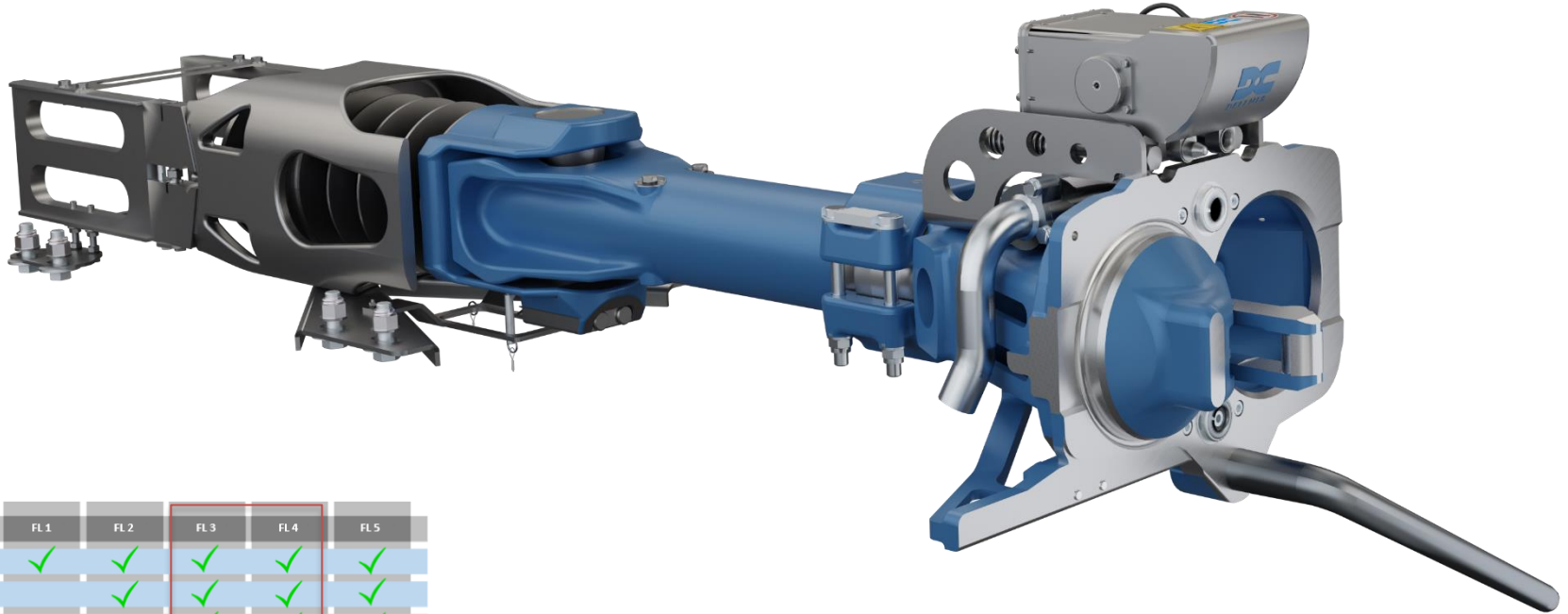
Functional level (FL)	FL 1	FL 2	FL 3	FL 4	FL 5
Mechanical	✓	✓	✓	✓	✓
Main brake pipe		✓	✓	✓	✓
Power line			✓	✓	✓
Data connection				✓	✓
Automatic decoupling					✓

## Level 2



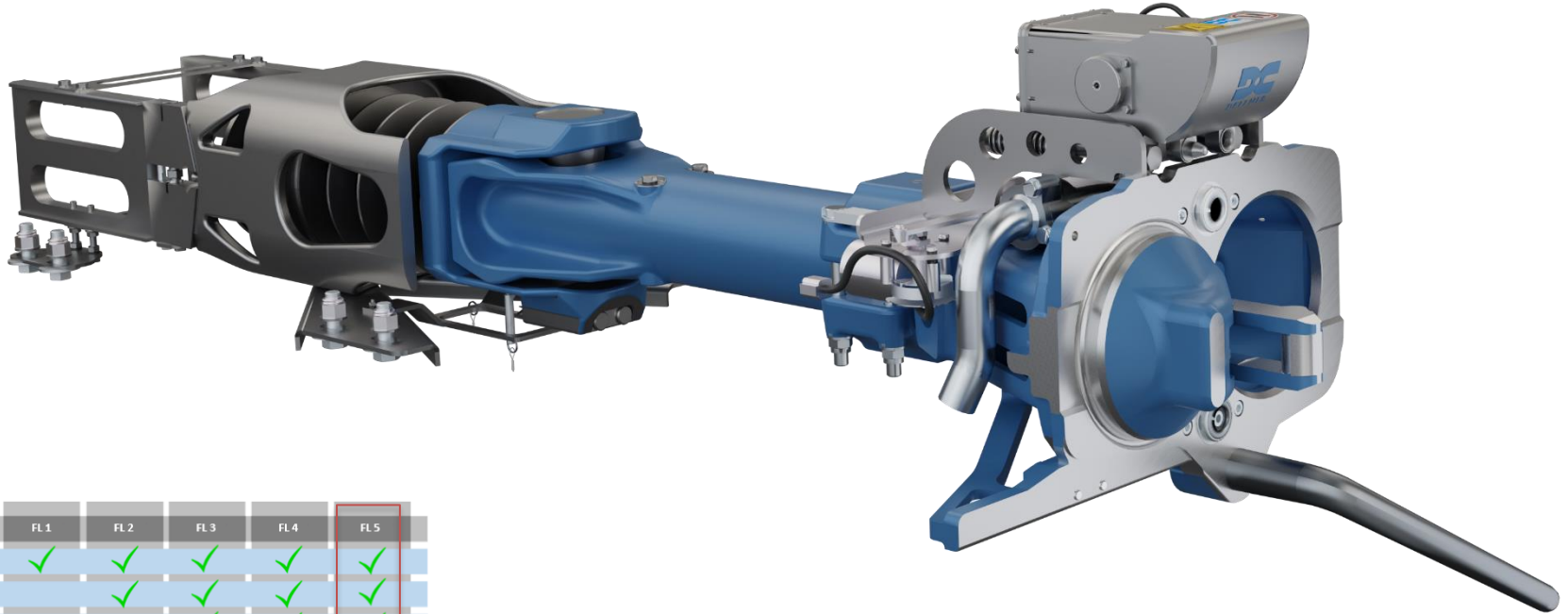
Functional level (FL)	FL 1	FL 2	FL 3	FL 4	FL 5
Mechanical	✓	✓	✓	✓	✓
Main brake pipe		✓	✓	✓	✓
Power line			✓	✓	✓
Data connection				✓	✓
Automatic decoupling					✓

## Level 3 & 4



Functional level (FL)	FL 1	FL 2	FL 3	FL 4	FL 5
Mechanical	✓	✓	✓	✓	✓
Main brake pipe		✓	✓	✓	✓
Power line			✓	✓	✓
Data connection				✓	✓
Automatic decoupling					✓

## Level 5



Functional level (FL)	FL 1	FL 2	FL 3	FL 4	FL 5
Mechanical	✓	✓	✓	✓	✓
Main brake pipe		✓	✓	✓	✓
Power line			✓	✓	✓
Data connection				✓	✓
Automatic decoupling					✓

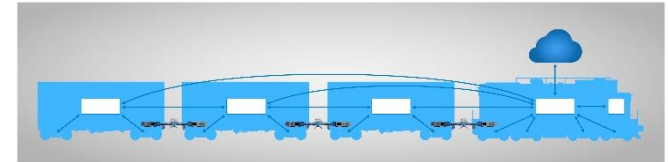
# Main features of DAC digitalization

Functional level (FL)	FL 1	FL 2	FL 3	FL 4	FL 5
Mechanical	✓	✓	✓	✓	✓
Main brake pipe		✓	✓	✓	✓
Power line			✓	✓	✓
Data connection				✓	✓
Automatic decoupling				✓	✓

Digitalization is dedicated to level 4 & 5

### Major challenges for DAC digitalization:

1. EP breaks
2. Automated break test
3. Train integrity: wagon no.& orientation detection

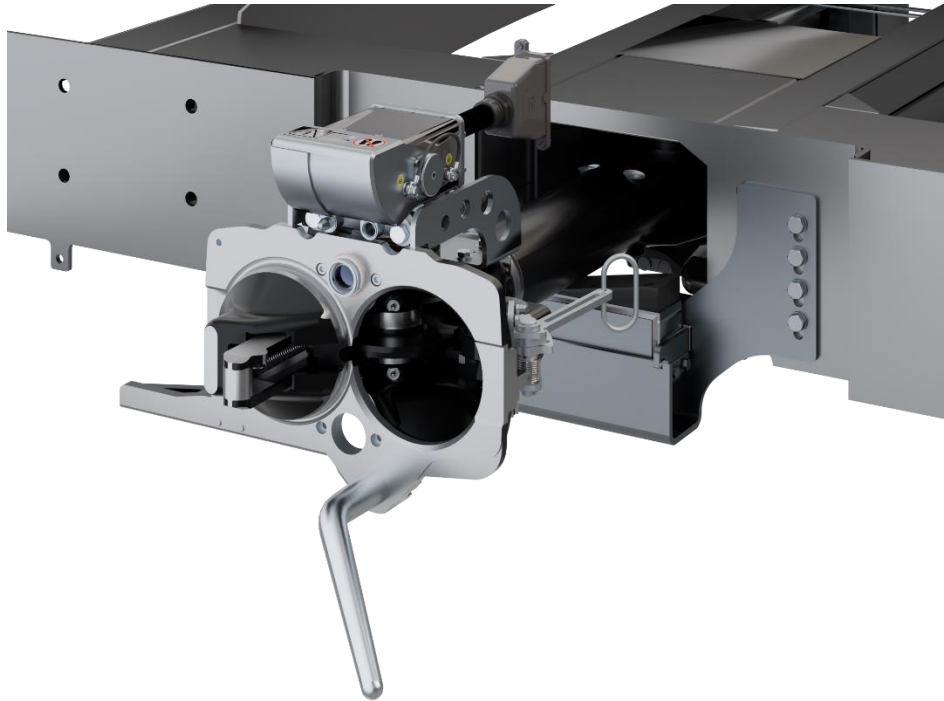


### Optional use cases:

- Condition monitoring
- GPS positioning
- Cloud communication (5G)







**UIC 530-1 type 4A**

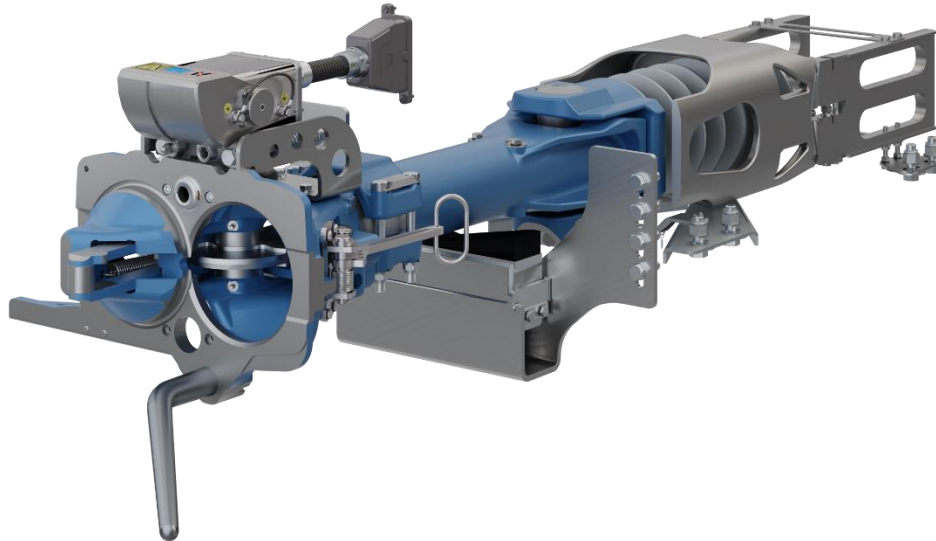


**UIC 530-1 type 6A**

## Assembly on wagon

## **Dellner DAC assembly on the freight wagons**

## DAC generation 3









# Testing





## New functionality for safe uncoupling



THE **HYBRID COUPLERS**  
FOR **BETTER SUPPORT** IN  
THE **MIGRATION PROCESS**



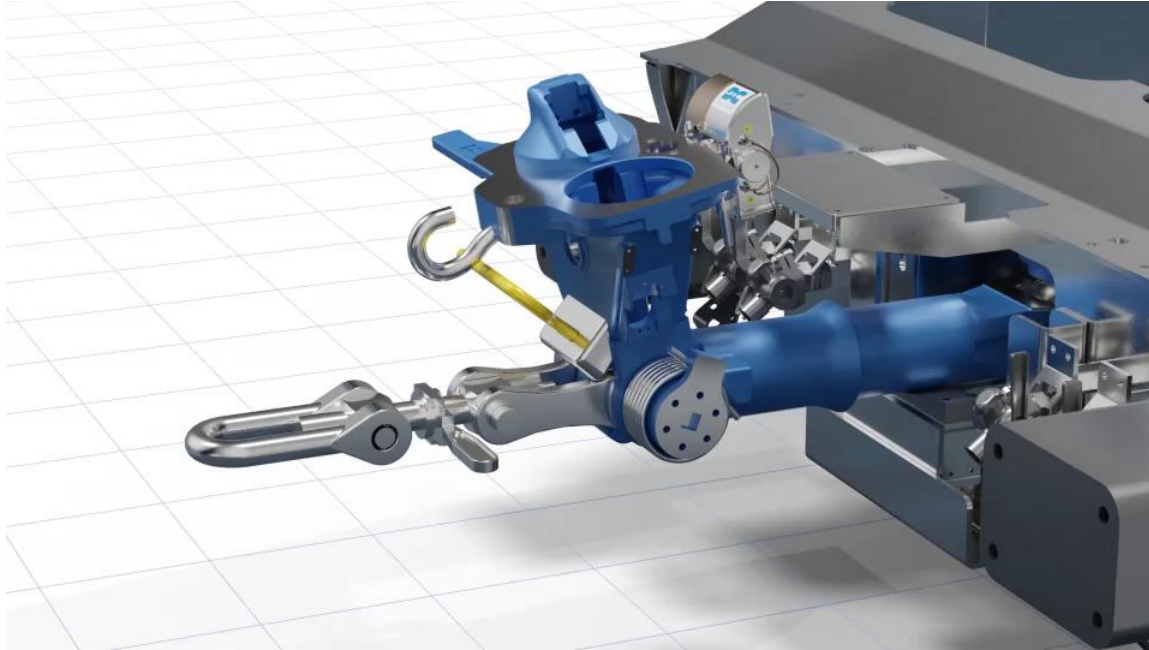
**HYBRID DAC**  
FOR LOCOMOTIVES

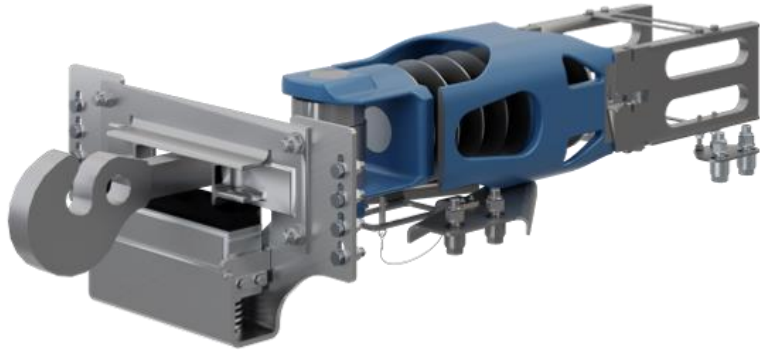
**MAIN BENEFITS OF THE HYBRID COUPLERS:**

FULLY COMPATIBLE WITH SCREW COUPLER INTERFACES AND NEW DAC INTERFACES / CONNECTING THE OLD AND NEW FLEETS

DESIGNED TO FIT EXISTING LOCOMOTIVE INTERFACES

AVAILABLE WITH ALL DAC FEATURES





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