Digital automatic couplers are now being tested in the steel shuttle operated by Green Cargo for SSAB. Photo: Maria Lindholm/Green Cargo

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Digital automatic couplers are now being tested in Sweden's heaviest freight train

Tests of digital automatic couplers (DAC) are now underway under some of Europe's most demanding railway conditions as the steel shuttle is equipped with the latest technology. Green Cargo operates the Luleå–Borlänge route with the freight train, which is a central part of SSAB's production chain. The test is part of the FP5 TRANS4M-R innovation project within the framework of Europe's Rail Joint Undertaking (EU-Rail).

The steel shuttle transports steel slabs daily from SSAB’s steel mill in Luleå to the production facility in Domnarvet, Borlänge, and with train weights of up to 3,800 tons, it is regarded as the heaviest freight train outside ore transport in Sweden. The transport route between Luleå and Borlänge spans over 1,000 kilometers, including the main line through northern Sweden, which in parts is both winding and hilly. In addition to the train's weight, the cold poses a challenge for the new technology, putting the coupler’s robustness to the test.

"Green Cargo is pleased to help drive the development of safer and more efficient freight transport. With SSAB's trust, the steel shuttle provides the project with unique insights that will serve as important decision-making data for the next phase," says Björn Landström, Project Manager at Green Cargo.

The train consists of up to 40 freight wagons, of which 2 pairs of wagons have been equipped with DAC from different manufacturers. The aim is to analyze how the couplers perform over time under extreme winter conditions and in challenging terrain. The test period will last for approximately two years, during which the two pairs of wagons are expected to travel about 320,000 kilometers.

"This is an important step in the development of DAC, where Sweden is the first in the EU to demonstrate the technology in a real commercial environment. This marks a crucial step in the preparations for the launch of pioneer trains," says Jan Bergstrand, Senior Strategist at the Swedish Transport Administration.

The pioneer trains are part of the European DAC Delivery Programme’s vision to introduce more fully DAC-equipped trains in Europe starting in 2026/2027, as preparation for a broader implementation and modernization of rail freight transport.

Integrating a demonstration train into regular traffic requires collaboration between multiple actors. The Swedish Transport Administration is responsible for the tests and the preparation of the demonstration train, while Rail Sweden at Lindholmen Science Park leads the project. The Swedish Machinery Testing Institute also supports with measurements and test preparations. At the start of testing, the train has been equipped with digital automatic couplers from Dellner and Voith, with more suppliers and

wagon pairs to be added during the project.

Digital automatic couplers enable automatic coupling and uncoupling of wagons, as well as electrification and data transfer through the train, improving safety, increasing railway capacity, and strengthening competitiveness. The coupler eliminates manual processes, which are currently time-consuming, physically demanding, and carried out in a high-risk work environment. The technology also enables longer and heavier trains, as well as remote-controlled uncoupling of wagons and automated brake tests, helping to prepare trains for departure more quickly and efficiently.

Facts:

FP5-TRANS4M-R under Europe’s Rail Joint Undertaking aims to establish rail freight transport as the backbone of the most climate-smart and resilient logistics chain. It builds on the European Commission's goal to increase rail freight transport through greater capacity, enhanced cross-border coordination, improved management of the rail network, and new technologies such as digital coupling and automation. The project aims to achieve higher throughput, shorter transport times, maximize flexibility and reliability of rail freight services, and mitigate demographic changes through automation and digitization of operational processes. Through this, the project seeks to reduce average transport times, operational stoppages, energy consumption, and the overall climate footprint.

Green Cargo is a sustainable logistics partner and a crucial part of Scandinavia's trade and industry. Almost 98 percent of our transports takes place using electric trains with a very low climate impact. Every 24 hours, some 400 freight trains depart, replacing around 9,000 truckloads on the road network. We serve close to 300 locations in Sweden, Norway and Denmark through our network, and with our partners we reach all of Europe. Green Cargo is owned by the Swedish State. We transport 20 million tonnes of freight, have 1,800 employees and annual sales of about SEK 4,2 billion (2023).

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